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Part II

TANGANYIKA

DEPARTMENT OF AGRICULTURE

ANNUAL REPORT

1953

PART I

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TANGANYIKA

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INTRODUCTION

Agricultural Policy

Tanganyika, although it has other useful sources of wealth is mainly an agricultural and pastoral country. Its rainfall is variable and its seasons irregular, and while it is paramount to produce sufficient food for feeding the entire population including the labour employed in mining and transport and in the all important sisal plantation industry, the policy of doing so is from time to time frustrated in effect by conditions beyond the control of man.

Sisal has been mentioned. It is also an important part of policy to maintain and increase the output of a number of other crops for export such as cotton, coffee and tobacco, to provide advisory services for their producers and for the producers of the lesser but valuable pyrethrum and seed bean crops and for the minor products described in the following pages. To the production of the staple food crops, needing experimentation on many aspects of cultivation, and skilled seed improvement, must be added the development and study of rice production with the help of experts in water engineering. Passing from the particular to the general, there must be much collaboration between the Department of Agriculture and the Provincial Administration, together with other departments in the Natural Resources group with the common object of improving the conditions of human life and extending the means of production into unused territory. Self sufficiency in food and increased production for export must be assisted by the conservation of good land, the rehabilitation of congested areas and by the opening up of new country. Both science and practice are needed here. Furthermore, the increasing interest among the African section of the population in the management of the marketing of their own products denotes the high necessity for agricultural men to be sympathetic and helpful with the co-operative movement while insisting upon the maintenance of recognized standards of quality. These, briefly, are among the chief items of agricultural policy.

WEATHER AND GENERAL REVIEW

In 1952/53, the short rains were a virtual failure over most parts of the Territory, and in many areas the following long rains also proved inadequate. In others rain fell out of season, and was largely valueless. These unsatisfactory conditions resulted in severe food shortages which demanded importations of grain from outside the Territory, and an inevitable decline in the production of most of the annual economic crops. The Central Province, which suffered most, had very poor rainfall with an even worse distribution and, as a result, very few crops survived, particularly in Ugogo where food

shortage relief measures had to be introduced. The early cessation of the main rains in the Southern and Southern Highlands Provinces and parts of the Eastern and Western Provinces resulted in a severe reduction in the yield of annual food crops. In the Northern Province, which experienced one of the worst droughts within memory, all food crops, except beans, were very disappointing and what promised to be a record wheat crop was severely affected by the attacks of grain-eating birds. On the other hand, rains which continued unseasonably late in the Tanga Province caused difficulty in the harvesting of maize and a considerable loss of crop resulted. In the Sukumaland districts in the Lake Province where rainfall was below average, it was clearly shown that crops can be grown on surprisingly little rainfall provided that sound agricultural husbandry is practised and that the planting programme is devised to fit the prevailing conditions. The cotton crop in fact yielded well but its acreage was much reduced. Cassava again proved itself invaluable and saved the situation in many areas. From the Southern Province a substantial export of cassava to other parts of the country was most useful.

While the general picture was coloured by the prevailing food shortage it is to be recorded that although the production of economic crops was on the whole below the highest, our main standby achieved a record output, i.e. the sisal industry's production of 168,763 tons exceeded the previous best by a substantial margin. And although cotton did not reach the high record of 1953, the out-turn of over 50,000 bales exceeded the results of the other three years of this five-year period. New plantings of tea came into bearing, a record crop was produced and three new tea factories were opened. Our one sugar estate crushed substantially more cane from its areas of new ground under irrigation. The paddy yield was in many districts poor and because of food shortage among growers, did not appear on the markets of those districts, yet in Rungwe and Rufiji a large tonnage came forward. Coffee production, both on African holdings and on non-native plantations in the Northern Province, declined sharply, but the hard-coffee industry of Bukoba achieved the highest output so far obtained, while there was a distinct advance in African mild coffee in the Southern Highlands. Seed bean growers did fairly well. The pyrethrum farmers had a normal year and the "bright" flue-cured tobacco industry of Iringa did not suffer so badly from the drought as had at first been feared. The results of the African fire-cured industry were, however, disappointing. Papain growers had to contend with falling prices. Copra maintained a satisfactory price level and a moderate yield. Sisal prices did not go up but coffee reached very high figures indeed.

Reviewing the year from the farmers' point of view, it may be said that for those whose main business it was to grow cereals 1953 was a most discouraging year, yet a number of other crops yielded fairly well and were reasonably profitable.

MARKETING AND GRADING OF PRODUCE

Foodstuffs

Government continued to control the purchase of maize, wheat, white sorghum and paddy and prices were fixed for delivery at railhead, grain store or mill, less deductions for transport and the services rendered by agents at markets distant from these points.

Dried cassava was, in this year of food shortage, also brought under control. The Grain Storage Department purchased the under-mentioned quantities of food grown in Tanganyika:

	Tons
Maize and White Sorghum	24,298
Red Sorghum	1,763
Golden Millet	600
Cassava	4,866
Rice (hulled)	5,330

Wheat was, as formerly, purchased by the Kenya Farmers' Association, acting as agents. Basic prices of these foodstuffs in 1952 and 1953 were fixed as follows:—

	1952 Shs.		1953 Shs.
Maize and White Sorghum (unbagged)	30/30	...	34/- per 200 lb.
Wheat, Grade I (unbagged)	45/35	...	52/06.
Paddy (guaranteed minimum price at railhead) (unbagged)	42/50	...	60/- (a) per 100 kilos.
Cassava (unbagged)	—	...	18/- (b) per 100 kilos.

NOTES: (a) Delivered at mills, Dar es Salaam, Lindi and Mikindani. Paddy prices varied according to the distance of the producing area from Dar es Salaam, and including all market fees, transport charges, buying margins and expenses of traders/millers up to the point of delivery.

(b) Price paid to producers at Native Authority markets per 100 kgs.

THE MARKETING OF COTTON

The Lint and Seed Marketing Board, having the backing of the Cotton Price Assistance Fund, was able to guarantee a price of 50 cents per pound of seed cotton to the growers in the Lake Province, and the corresponding basic figure of 110 cents per kilo elsewhere, and to announce the guarantee before cotton planting began. During the course of the seed cotton buying season the world value of cotton advanced and in consequence no need to call upon the fund arose. On the contrary, the results of the marketing of the 1953 crop are likely to show a satisfactory though not excessive balance on the right side.

No forward contracts were made, the whole crop being disposed of by auction. In the case of the Lake Province crop, the Lint and Seed Marketing Board made use of the corresponding organization, the Lint Marketing Board of Uganda, for sales by auction to take place in Kampala, and as regards cotton grown in the Eastern, Northern, Tanga and Southern Provinces, the agents of the Board, the Tanganyika Cotton Company, sold the crop by auction in Dar es Salaam. Cotton seed was disposed of at auction sales held in Mwanza and Dar es Salaam. Practically the whole quantity was taken up by local oil mills at satisfactory prices.

A notable feature of the 1953 cotton season was the great interest taken by growers in co-operative marketing. The first stage, the formation of co-operative collecting societies, which receive the seed cotton at their own centres and bag it and forward it to the ginners, was given encouragement and assistance in several of the ginnery zones. For a first year, their operations were remarkably successful. There is no doubt that the movement will now advance rapidly.

Marketing of Tobacco

(a) *Fire-cured.*—African produced dark fire-cured tobacco grown in the Southern Province continued as before to be packed in the factory of the Ngoni-Matengo Native Co-operative Union, and sold under the directions of the Songea Native Tobacco Board. Twenty primary societies sell the leaf of the producers. Some sixty-three per cent of the produce was exported overseas, the balance being purchased by East African cigarette factories.

The dark fire-cured tobacco grown in the Lake and Western Provinces continues to be disposed of through the Nyamirembe Native Tobacco Board to manufacturers in East Africa.

(b) *Flue-cured.*—The bright flue-cured leaf grown in the Southern Highlands Province was, as usual, graded and processed in the factory of the Southern Highlands Non-Native Tobacco Growers' Union Ltd., and marketed satisfactorily by them through their agents.

Marketing of Pyrethrum

The pyrethrum crop was sold as formerly through the Kenya Farmers' Association, the joint agents of the Kenya and Tanganyika Pyrethrum Boards. Growers receive a first payment according to weight on delivery at the agent's premises; a second payment is made when the pyrethrin content of the consignment has been determined by sample analysis, and a final pay-out is made when the year's accounts are closed.

Marketing of Coffee

The Kilimanjaro Native Coffee Union and the Tanganyika Co-operative Trading Agency both supported the coffee auctions held in Moshi during the marketing season, October to April. The former organized the disposal of the mild coffee produced by its constituent co-operative societies on Kilimanjaro and the latter dealt with that derived from co-operative societies of African producers in other parts of the Territory. The Meru Native Coffee Growers' Association (which is not a registered co-operative) sold their small crop (132 tons in 1953) to the Ministry of Food at a fixed price. The Tanganyika Coffee Growers' Association which includes the whole body of non-native coffee planters delivered mild coffee against a contract with the Ministry of Food.

The Bukoba Native Coffee Board continued its policy of marketing the hard coffee crop of the types known as "Native" and "Plantation" by auction in Mombasa. These sun-dried robusta and arabica coffees are sold by the growers to local small dealers or through co-operative societies to the Board, which then arranges for factory hulling and/or cleaning to be done. The coffee is inspected by a Government grader before dispatch to Mombasa for sale. From a total of 178,661 bags inspected by the coffee grader, 21,208 were rejected as not conforming to grade.

Produce Grading and Inspection Service

With the intention of establishing a produce inspection service, in the first place for cashewnuts and eventually for other produce, an officer was posted to the port of Mtwara to study this subject during the waiting period

while the first buildings are completed. Pending these developments this officer conducted random sampling of cashewnut consignments and issued certificates of opinion for the use of exporters.

MAIN CROPS

Sisal

An increase in sisal production can again be recorded and estates, of which there are 165 producing sisal (line fibre and tow), produced 165,725 tons. The total area under sisal at the end of 1953 was estimated at 601,500 acres, an increase of some 33,500 acres on the total area at the end of 1952. In addition to this output by estates some 3,038 tons of African hedge sisal were also produced; a decrease of 1,459 tons on last year's figure. Total production of this crop, which is the most important in the Territory's economy, amounting to 168,763 tons, represents a new high record and yields might well have been even higher had the weather been more favourable. The inadequacy and early cessation of the long rains materially affected the output of the Central Line crop, due to wilting of the fleshy leaves. In the Tanga and Northern Provinces however, new areas that had been planted during the period of high prices came into bearing and there was an increase in production. The Southern Province production remained steady.

The value of the sisal crop per ton was considerably lower than in 1952 and the average f.o.b. value to growers for line fibre and tow exported was only £75 per ton as against £137 in 1952. Market quotations (per ton c.i.f. European ports) for No. 1 grade line fibre varied during the year between £97 and £90 per ton. (This does not however necessarily represent the average price received by growers).

The following figures show the production, export and export value of line fibre and tow during the last five years:—

Year	*Production*	*Export*	*Value (Export)*
	Tons	Tons	£
1949 ...	123,296 ...	132,514 ...	11,111,232
1950 ...	121,598 ...	118,909 ...	11,846,057
1951 ...	145,223 ...	142,106 ...	23,689,454
1952 ...	162,185 ...	156,167 ...	21,708,053
1953 ...	168,763 ...	171,151 ...	12,773,839

The report of the Sisal Research Station at Mlingano is printed in Part II of this report.

Coffee

Milds.—The 1952/53 arabica crop, prepared by the wet pulping method, amounted to 3,738 tons of clean coffee. The bulk of this comes from Mt. Kilimanjaro and Mt. Meru in the Northern Province where the drought severely checked flowering, withered the young berries, and reduced the yield to the lowest known for many years. Of the total, the Kilimanjaro Native Co-operative Union's share was 1,574 tons and the non-native estate's only 895 tons. Open market prices were, fortunately, excellent, £444 per ton being the average in the Moshi auctions.

A notable advance in the production of high grade coffees took place in the Rungwe (Southern Highlands) District which produced its record crop of 505 tons. While it is not all of the highest quality, the sale of one parcel of Rungwe coffee at a price of £679 a ton is worth recording. Another district in which Africans are taking a satisfactory interest is Songea and it is in these comparatively new coffee areas where particular attention needs to be paid to good pruning, spraying and preparation methods upon the model of the Moshi Native Coffee Board. Songea produced 263 tons and Mbosi 103 tons. Moderate increases of crop may be expected in the near future from new plantings on estates and on African peasant holdings.

Hards.—The hard coffee crop, prepared by sun-drying the cherry, is chiefly derived from Robusta coffee, but a smaller amount of Arabica coffee is also grown, for hard coffee production. The output of this crop, which is the important crop in the Bukoba District of the Lake Province, was a record and totalled some 10,974 tons. Illegal movement of coffee makes it difficult to arrive at an accurate figure, and included in this total are 1,860 tons exported from the port of Nyamirembe but almost entirely produced in the Bukoba District, and all but an insignificant quantity, by African growers. The Bukoba Native Coffee Board gave much thought to its policy as regards the preparation of the crop for marketing. Conclusive evidence has not yet been received as to the effect of encouraging the African grower to hand hull his own cherry, and until this evidence is received it is difficult to decide on the future course of action. As regards the responsibility of the Board for the culture of the coffee crop, its original decision has been reversed and supervision of field work is again in the hands of the Agricultural Department while the Board reimburses the cost of the staff.

Small tonnages of coffee both Robusta and Arabica were produced in the Tanga Province, and some eighty-eight tons of "buni" coffee, prepared by sun-drying, were marketed in other parts of the Territory. The report of the Coffee Research Station, Lyamungu, is printed in Part II of this report.

Cotton

The Territorial crop, after the record obtained in 1952, fell to a total estimated at 50,247 bales of lint due to the poorness of the rains.

In the Lake Province, the acreage under cotton was approximately half that of the 1951/52 season, due largely to the inability to plant, owing to the complete failure of the short rains in many areas, and to the fact that fields that were planted failed to germinate. This considerable drop in acreage was, to a large degree, offset by the improved methods of husbandry practised by the cultivators, in that where possible they planted early, tie ridged and clean weeded their fields. Yields were also above average owing to the negligible importance of "blackarm" and the low incidence of American bollworm following on the failure of the maize crop. The total crop for the seven producing districts amounted to 38,600 bales of lint of which ninety-three per cent were AR grade.

In the Eastern Province, all districts, except the Rufiji, showed a marked increase in cotton production, and seed cotton produced by Africans was the highest recorded since 1942. The total crop would have been still greater but for the lack of flooding in the Rufiji, which prevented post flood plantings.

In addition, a heavy incidence of bollworm in one district, coupled with late planting rains, reduced the crop from a much increased acreage and led to over twenty per cent of the lint being classed as BR or stained. Cultivation by non-natives was negligible, amounting to only some 400 acres in all. Multiplication of the variety 47/10, developed at Ilonga Research Station, was undertaken on a field scale during the year. This cotton is a distinct improvement on the local strain, and its higher yields and lint value will, from the grower's point of view, offset any reduction in price that might otherwise be necessary owing to its lower ginning out-turn. Smaller tonnages of cotton were grown in the Southern, Northern and Tanga Provinces. In the Southern Province, interest declined still further in some districts and with unsatisfactory climatic conditions quality was poor and there was considerable staining. In the Northern Province the 1952/53 cotton crop was extremely poor and only 107 tons of seed cotton were produced in the Moshi District. Prospects for the 1953/54 crop however are the best for some years, and by the end of the year 248 tons of seed cotton had already been marketed.

In the Tanga Province, the late starting of the long rains was responsible for a good deal of the loss in crop, which amounted to only one quarter of that produced in the previous season. In this Province, also, the 1953/54 season shows more promise and the crop should exceed 400 tons of seed cotton which, while still short of past yields, indicates that it is getting back to normal after two poor seasons. The final result of the cotton season was not in total unsatisfactory.

The production of lint over the past few years is given in the following table:—

Province	1940-49 (Average)	1950	1951	1952	1953 ([redacted])
Lake ...	35,122	38,905	42,349	70,298	38,600
Eastern ...	9,786	8,433	3,047	6,723	9,927
Northern ...	1,253	1,356	1,970(a)	562	1,864
Tanga ...	1,010	849			
Southern ...	755	172	145	179	247
Total ...	47,926	49,715	47,511(a)	77,763	50,638

All in bales of 400 lb. (a) Amended figure.

Other aspects of cotton are dealt with in Part II of this report, which contains reports of the Agricultural Station, Ukiriguru, (Lake Province), for the 1952/53 season, and the Annual Report of the Agricultural Station, Ilonga (Eastern Province) for 1953.

Copra

A great deal of attention was paid by the Field staff to the improvement of plant sanitation in the coconut groves. Good progress in this regard is reported from the Tanga Province where production of copra was well above the average. Yields were low in the Eastern Province and production in the Southern Province has not yet recovered from the effects of the severe storm which destroyed so many trees in 1952. It is to be recorded that in many parts of these coastal districts constant pressure is required to keep up a proper standard of cleanliness in the plantations and even in some cases

to induce African owners of coconuts to keep down the bush. Nevertheless progress is being made. Copra prices varied widely between Shs. 10/- and Shs. 20/- a frasila for sun-dried, and less steeply between Shs. 18/50 and Shs. 23/- per frasila for kiln-dried and clean sun-dried. The higher prices obtained for kiln-dried copra helped a number of Africans to build small kilns under the guidance of Agricultural Officers.

The coconut planting bonus scheme made little progress in the Eastern Province but had better success on the Tanga coast, where some 700 acres of coconuts have now been planted with this assistance. Six nurseries from which good seed is issued have been established. The Department continued to supervise three Government plantations at Bagamoyo and two in Mafia Island, and, as a matter of convenience, the Veterinary Department carried on the management of the extensive area of coconuts surrounding their Tanga dairy farm.

The total production of copra is estimated to have reached 12,096 tons in 1953 and this total, considering the dry weather, is considered to be not unsatisfactory. It includes a quantity estimated to have been about 2,200 tons produced by non-native planters. The following table shows statistics of copra marketing during the last few years. The actual production of coconuts was, of course, considerably greater, the balance being consumed as food by peasant proprietors:—

	Tons				
Province	1949	1950	1951	1952	1953
Eastern ...	9,388	5,508	3,991(a)	9,988	5,856(b)
Tanga ...	5,147	4,557	3,518	4,081	5,821
Southern ...	1,751	943	1,076	824	419
Total ...	16,286	11,008	8,585	14,893	12,096

(a) Excludes estate production. (b) Includes 2,200 tons estimated non-native crop.

An account of the work on coconuts at the Coast Agricultural Station, Chambezi, is printed in Part II of this report.

Cassava

The policy of encouraging African cultivators to plant a stated minimum area of cassava in all parts of the Territory to which it is suited was maintained at full pressure. 1953 brought home to a large number of Africans the great advantage and, indeed, the necessity of having reserves of cassava in the ground. Had it not been for these substantial reserves, the Territory would have had to import even larger stocks of relatively expensive grains.

In the Eastern Province a cassava planting register for all tax-payers, originating from that used in the Rufiji District, was introduced with marked success. The area under cassava in the Central Province was increased generally and the extension of the planting campaign was only limited by a shortage of planting material, due to the ravages of pigs, baboon and termites and to theft. Had it not been for the good stocks of cassava in the Western Province as a result of previous planting campaigns, the food situation would have been far worse. In other areas reports indicate that cassava acreages have been increased and have helped to offset shortages of the staple grains. In some parts considerable quantities are supplied to sisal estate labour, and

the sale of the crop constitutes a substantial part of the cultivator's income. Market sales bear no true relation to the value of this crop, for in some districts such as those of Kisarawe, Bagamoyo and Morogoro it is the staple food. In others, considerable internal trade takes place as in the Kondoa-Irangi District and in Manyoni, where the peasants reaped the benefit of a three years' extensive cassava growing campaign, and where a good deal of this food was disposed of within the area concerned for domestic use. Large quantities of cassava were harvested in the Southern Province and, of the 8,000 tons marketed, some 6,000 tons went to assist food supplies in other parts of the country. Cassava has, for some years, been an important export crop from the Southern Province, but in 1953 its delivery overseas was restricted because of the need to relieve shortages within Tanganyika.

The following table records the marketing of cassava in recent years, but as mentioned above the figures representing the quantity sold were of course only a moderate proportion of that actually grown and lifted:—

Marketed Tonnages of Dried Root

Province	1949	1950	1951	1952	1953
Southern ...	6,041	1,252	8,894	26,000	8,044
Western ...	2,380	1,751	2,340	3,150	3,423
Eastern ...	523	19	112	127	236
Central ...	—	—	31	—	606
Lake ...	256	30	17	—	—
Total ...	9,200	3,052	11,394	29,277	12,309

Castor Seed

Despite a fall in prices from £50 to £30 a ton paid to the producer, the popularity of this crop is increasing. The total Territorial production was less than in 1952, but this is due to climatic conditions (there was a large drop in the Central Province which had been for the past two seasons the biggest producing area). The present policy in that province is to discourage the planting of castor until all food crops have been planted. On the other hand, a significant increase is reported from the Southern Province.

The following table shows the recorded marketing of castor seed during recent years:—

Tons

Province	1949	1950	1951	1952	1953
Eastern ...	690	1,046	820	1,664	1,261
Central ...	333	652	1,621	2,823	798
Southern ...	54	151	374	609	1,978
Southern Highlands	—	—	600	635	476
Tanga ...	—	111	400	400	398
Northern ...	—	30	100	1,108	1,230
Western ...	—	—	10	—	—
Total ...	1,077	1,990	3,925	7,239	6,136

Cashewnuts

In the Southern Province, weather conditions were too dry for even this drought-resistant tree, with the result that both size and quality of the nut suffered. Over the past few years there has been a steady increase in planting

by both Africans and non-native owners, and had conditions been more favourable this would have been reflected in a further rise in exports. There is also an increasing interest in cashew planting in the coastal regions of the Eastern Province by African growers and others though there is still ample room for further expansion. As in the Southern Province, yields and quality suffered this season and insect pests took their toll. The average price paid to the producer was somewhat disappointing, and in the Eastern Province it was only £30/£35 per ton—some £15 below that of last year. A Cashew-nut Growers' Association was formed towards the end of the year in the Southern Province. This should do much to stimulate interest and increase production still further.

Reported sales by growers are given below:—

					Tons
Province	1949	1950	1951	1952	1953
Eastern ...	444	1,117	1,073	1,745	1,297
Southern ...	3,276	4,787	5,308	9,064	8,768
Total ...	3,720 (a)	5,904	6,381	10,809	10,065

(a) A year of low rainfall resulted in poor crops.

Groundnuts

Crops were generally disappointing throughout the country despite increased plantings in parts of the Western and Southern Highlands Provinces. The lateness and inadequacy of the rains coupled with the heavy incidence of rosette disease were the main contributory causes, particularly in the Western Province, where in many cases yields were insufficient for seed purposes, and in the Southern Province where production is declining. In parts of other provinces such as the Lake and Central, yields were negligible and to a large extent the sale of seed had to be prohibited.

Reported sales (excluding the Overseas Food Corporation) during 1953 were as follows:—

					Tons
Province	1949	1950	1951	1952	1953
Western ...	—	475	1,301	5,461	389
Central ...	—	383	1,183	2,590	388
Lake ...	—	296	1,051	2,199	20
Southern ...	—	21	990	632	406
Total ...	10,880	1,175	5,525	10,882	1,183

Maize, Sorghum and Millet

The market returns for maize, millet and sorghum for the years 1951, 1952 and 1953 were respectively 69,166 tons, 49,484 tons and 23,480 tons.

The failure of the short rains in many parts of the Territory and the inadequacy and poor distribution of the main rains caused severe reductions in the grain crops in most provinces.

In the Northern Province non-native farmers, who had increased their planted acreages, were hard hit by the drought, particularly in the Loljoro area where the maize crop, instead of the normal 7,000 to 8,000 tons was negligible. African-grown maize also suffered, though crops in the Mbulu District were surprisingly better than had been expected.

In the Tanga Province crops were poor but maize yields were generally better than had been obtained in 1952. Extensive acreages were planted in the Handeni District, germination was good and a crop of 5,000 to 6,000 tons was anticipated. In June, however, when cobs were beginning to dry off, the rains recommenced, the crop was irreparably damaged and fifty per cent was lost. Extension of sorghum planting into the drier areas of the Province continued and requests for seed are now being received particularly from the Pare District.

The early-planted sorghum crop in the Lake Province caught the short rains in November and thereafter despite the long dry spells survived to give good yields. Many areas, however, were late in their planting and, with only scattered showers until March, partial success only was obtained. The failure of the early rains made planting conditions in the main bulrush millet areas almost impossible, but rain in some parts was just sufficient for germination. Heavy and widespread March and April rains revived the sorghums and some late plantings of maize and millet were possible; but the growing season did not extend itself as had been hoped with the result that poor yields were the general experience. A satisfactory maize crop was produced in North Mara District.

The failure of the short rains in the Eastern Province caused a number of local food shortages during the first half of 1953. Good long rains were experienced in the districts of Bagamoyo, Uzaramo and Northern Rufiji and adequate maize crops were harvested. Elsewhere in the Province, a two and a half months' dry spell killed all initial plantings of food crops. Considering these conditions, and with a further dry period in April, growers were fortunate to harvest any crops at all.

The Central Province which suffered most experienced poor and badly distributed rains. Few crops survived, particularly in Ugogo, where extensive relief measures had to be introduced. The districts of Singida and Kondoa-Irangi fared better and moderate crops were harvested in the higher areas.

Bulrush millet in the Western Province gave fair yields in spite of the poor growing season and in Kahama District it was the only crop which yielded well. The great increase in finger millet (Eleusine) exported from Ufipa District in 1952, was almost maintained during 1953, despite the poor season. Maize yields were below average in many areas and depressed the available quantity of sorghum for sale. Weather conditions in the Southern Province were unfavourable for grain production, and of the moderate quantity marketed or harvested very little found its way to the Grain Storage Department. It is probable that any surplus was disposed of locally.

A poor maize harvest was obtained in most parts of the Southern Highlands Province, particularly in the lower areas where widespread failure occurred following very inadequate rains. In the Poroto Mountain areas of Mbeya District, however, satisfactory yields were obtained.

The following table shows the recorded tonnages of maize and sorghum marketed by growers in 1952 and 1953:—

Province	1952 Marketed tonnages	*Notes*	1953 Marketed tonnages	*Notes*
Northern	21,223 ...	All maize (12,518 tons non-native grown)	10,681 ...	All maize (5,457 tons non-native grown)
Tanga	566 ...	All maize (Handeni District).	2,960 ...	All maize (Handeni District).
Eastern	3,278 ...	Chiefly maize (477 tons non-native grown)	1,965 ...	Chiefly maize (521 tons non-native grown).
Central	170 ...	Chiefly sorghum ...	30 ...	Maize and Millet—all native grown.
Western	2,770 ...	Chiefly Maize ...	1,814 ...	Chiefly Maize.
Lake	2,633 ...	Not specified	1,112 ...	Not specified.
Southern	976(a)	Chiefly maize ...	1,851 ...	Approximately equal amounts maize and sorghum.
Southern Highlands	17,944 ...	All Maize	3,067 ...	All Maize.
Total ...	49,484		23,480	

(a) Revised figure.

It should be noted that the 1953 figure of recorded sales is less than that shown under Marketing of Produce for purchases by the Grain Storage Department. This difference is largely accounted for by the fact that purchases by the Grain Storage Department from the Overseas Food Corporation are not indicated in this table.

Pulse Crops

Encouragement is given wherever possible to the increased planting of the various mixed beans and pulses, such as pigeon peas, grams and cowpea, etc., not only for sale as cash crops, but also in order to provide a greater variety of diet in the African's menu which tends to lack sufficient protein. The production of pulse crops remained much the same as in previous years, except in those areas such as the Central Province where the low rainfall was inadequate and such crops as were grown were consumed locally by the cultivators. The sale of these crops was prohibited early in the year in this Province. Although some areas in the Northern Province had a marketable surplus of beans, these too were largely consumed locally.

The haricot bean crop in the Northern Province, totalling 2,810 tons, offered for sale was satisfactory in quantity, considering the adverse weather conditions, but somewhat disappointing in quality. There is no doubt that greater attention to market standards and to pest control is desirable if this industry is to become one upon which canners of white haricot can rely. The sounder growers have this problem very much in mind, and it is expected that proposals for better control and sanitation will be put forward before long.

Prospects of a continuation of attractive prices for dried peas in the Southern Highlands Province led to larger acreages being planted, but yields were lower than last year and, due to a drop in prices, surpluses had to be disposed of locally.

The multiplication and distribution of a green pea (Meteor), introduced to the Poroto Mountains in 1952, had to be abandoned and further cultivation discouraged, due to the overseas trade demand for yellow peas only. A suitable new variety is being sought.

The following table indicates recorded marketings of pulses during recent years, but is no real guide to the Territory's total production:—

	Tons					
Province	1949	1950	1951	1952	1953	
Lake ...	6,860	7,058	7,346	6,977	4,137	Chiefly chick peas and mixed beans.
Northern ...	690	3,015	10,177	3,728	4,297	Chiefly haricot beans and mixed beans.
Southern Highlands	296	307	2,132	2,630	1,189	Also considerable unrecorded marketings.
Western ...	809	551	2,061	1,991	867	Chiefly mixed beans.
Eastern ...	579	802	635	613	752	Chiefly mixed beans and pigeon peas.
Central ...	3	89	176	160	15	Chiefly cowpea.
Southern ...	3,128	2,333	1,833	4,652	1,076	Chiefly mixed beans.
Total ...	12,365	14,155	24,360	20,751	12,333	

Papain

The price of papain declined from around Shs. 30/- per pound to as low as Shs. 5/- per lb. and deliveries in the Northern Province at the end of the year practically ceased in consequence of this collapse. While there may be faults in the marketing of papain, the inescapable fact is that more is being produced than can be used, and until present stocks that have accumulated in the U.S.A. have been disposed of, there is little likelihood of any further rise in price. The Papain Growers' Association, mention of which was made in the 1952 Report, met on several occasions during the year. The question of legislating on the lines of the Pyrethrum Ordinance so as to enable papain to be marketed through one agent has been considered, but it awaits more support from the growers than they have so far manifested. Production during the year amounted to 78,400 lb., an increase of 27,342 lb. over last year.

In the Southern Highlands Province, a few farmers are growing pawpaw for papain production and, in the early part of the year, interest was directed towards increased plantings; but it is doubtful if this will be maintained in the face of declining prices.

Exports of papain during recent years are shown in Appendix II to this report.

Pyrethrum

The output of pyrethrum in the Northern Province showed a slight increase over that of the previous year. The general dry weather did not affect production, as good rains fell in the high altitude areas in which this crop is grown. Towards the end of the year, deliveries were seriously affected by the removal of Kikuyu labour from the Province.

In the Southern Highlands also, seasonal conditions had little effect on production during 1953, and a slightly higher output is recorded. The pyrethrum is delivered to Messrs. Kenya Farmers' Association at Nakuru and in Iringa respectively for baling and marketing or for extraction, and the main outlets are in the U.S.A., South America, the United Kingdom and Australia.

Pyrethrum marketing arrangements are also mentioned under the heading "Marketing and Grading of Produce".

One hundred and eighty acres of land near Njombe were earmarked for African pyrethrum growing and, to date, forty-four peasant growers have planted some twenty-one acres which produced eleven and a half hundredweights of dried flowers in 1953. The scheme is popular and shows promise of steady expansion. Local European growers continue to encourage and foster this trend and a central drier is to be erected during the coming year.

Reference may be made to the report of the Agricultural Officer (Experiments) printed in Part II of this report on his experimental work with pyrethrum in the Southern Highlands Province. The price of this useful "dollar" crop was well maintained.

The following table shows the production of dried flowers for the two growing areas during recent years:—

Province	1949	1950	1951	1952	1953
			Tons		
Northern	91	144	136	107	125
Southern Highlands ...	168	149	165	133	150
Total ...	259	293	301	240	275

Rice

There was a moderate increase in production over last year's total, and this was entirely due to the good crops produced in the Eastern and Southern Highlands Provinces. In the Rungwe District of the latter Province, the season was particularly favourable to paddy growing and this, combined with enthusiastic effort and a good price resulted in the record crop of 5,769 tons being produced. The previous highest record was 3,670 tons in 1949. In the Eastern Province the promulgated price towards the end of 1952 had the similar effect of increasing the acreage prepared for the 1953 season, particularly in the Rufiji and Mahenge Districts. Unfortunately, the short duration of the long rains, combined with the absence of flooding in the Rufiji Valley reduced the marketable surplus of swamp paddy, but 4,230 tons from the Rufiji was nevertheless a useful achievement. Good crops of upland rice were also obtained in this Province.

In the Tanga Province despite a fifty per cent increase in the acreage planted considerably less paddy was marketed than was anticipated. This was largely due to the poor maize crops in most of the rice growing areas, resulting in more rice being consumed by the cultivators. In the Lushoto District and in the Pares a good deal of attention was given to irrigation works and to trials and demonstrations of leaching of salts from the soil. Temporary weirs for taking off water in irrigation channels were constructed and other dams and minor furrows were dug.

Other Provinces report reduced crops of paddy and, even with good plantings, yields were poor. In the Lake Province, despite considerable land preparation, the crop was a virtual failure. In the Kwimba District, a Sukumaland Development Field Officer was employed full-time on all aspects of increased production of paddy in that District.

Trials continued with the combined culture of paddy and fish in constructed ponds.

The report of the Botanist in Part II of this report indicates some of his work on rice varieties.

The recorded tonnages of paddy (rice in husk) marketed by growers in recent years is shown in the following table:—

	Tons				
Province	1949	1950	1951	1952	1953
Eastern	2,270	6,024	9,305	2,823	6,657
Central	3	20	23	—	—
Southern Highlands	3,670	3,228	1,336	3,000	5,769
Southern	1,291	2,783	2,755	1,392	662
Western	222	914	2,037	2,250	630
Lake	1,293	5,155	4,502	5,185	1,300
Northern	—	194	188	51	61
Tanga	624	1,622	1,806	938	1,750
Total	9,373	19,940	21,952	15,639	16,629

Sunflower Seed

Sunflower seed production in 1953 showed a considerable decline. Smaller acreages were planted in many areas due largely to the sharp fall in prices paid to producers. The net result of unfavourable weather conditions and an unattractive price produced a Territorial total of only 2,819 tons.

Recorded marketed tonnages are given below but export figures are a more reliable guide as sunflower seed is produced in some areas by non-native planters and there are no recorded figures of their production. Total exports of sunflower seed for 1953 amounted to 6,180 tons.

	Tons			
Province	1950	1951	1952	1953
Lake	107	495	1,777	316
Western	630	1,172	6,028	446
Eastern	623	816	1,303	568
Central	202	149	265	80
Southern Highlands	1,194	800	960	160
Northern	1,186	1,237	738	420
Tanga (Handeni District)	—	350	179	216
Total	5,201	6,423	13,204	2,819

Sugar

The Tanganyika Planting Company at Arusha Chini continued to increase thei r output. A new weir and furrow from the Karanga River was completed and over 1,000 acres of the new area which can be irrigated have been cleared and prepared and 800 acres of this total have been planted to cane.

The following table shows the production of plantation white (and brown) sugar by the Arusha Chini factory in recent years:—

	Tons
1949 ...	7,659
1950 ...	8,055
1951 ...	8,805
1952 ...	9,666
1953 ...	10,708

Sesame

There was a fair surplus of this oilseed in the Southern Province and production was not far short of the previous year. Local mills extracted some 20,000 gallons of oil. The carry-over from the previous season accounts for exports being in excess of the recorded marketed tonnage. Most of the crop in the Eastern Province was lost due to the early cessation of the rains.

The following tonnage shows the recorded marketing of sesame in recent years:—

	Tons				
Province	1949	1950	1951	1952	1953
Southern	1,710	1,740	3,145	1,549	1,286
Eastern	238	385	279	286	229
Lake	27	12	37	64	3
Total ...	1,975	2,137	3,461	1,899	1,518

Seeds

The 1953 season for the export seeds industry in the Northern Province was, except for the Loljoro area, a satisfactory one. There was some increase in the production of lettuce, kale and flower seeds, and the main feature of the industry, namely high grade seed beans, produced exports of 1,460 tons of seed as compared with 1,251 tons of the previous year.

With the arrival of a newly-appointed Plant Pathologist to whose salary and expenses the industry contributes, preliminary formulation of proposals for seed inspection and certification were begun.

The production and distribution of seed, of various types, grown on the Department's experimental stations, continued and there was a notable demand for short-term maize seed grown on the Ilonga Agricultural Station. At Igumbiro the Department produced 4,000 ounces of tobacco seed for farmers in the Southern Highlands.

Tobacco

The flue-cured tobacco in the Iringa District of the Southern Highlands Province produced a total of 1,995,325 lb. compared with 2,290,087 lb. in 1952. This total exceeded earlier expectations and, considering the difficult season, was a fair crop. From the 6,144 acres planted, an average yield of some 325 lb. per acre was obtained. Cold winds in May caused some leaf damage and made curing difficult. Leaf quality was lower in 1953 than the previous year. Most farmers now use fertilizers. The industry continued to receive efficient guidance and control under the combined influence of the

Southern Highlands Non-Native Tobacco Board, and the Southern Highlands Tobacco Growers' Union. Marketing was conducted satisfactorily through the Southern Highlands Non-Native Tobacco Growers' Union and Messrs. Edwards Goodwin & Co. The bulk of the tobacco was disposed of to East African manufacturers except for some seven per cent to continental outlets.

The Tobacco Board purchased a very suitable farm close to Iringa where it is intended to concentrate all tobacco experimental work in the future. One of the first tasks of the Field Officer, seconded to the Board, is that of finding a suitable Virginian variety or varieties to replace Ehlers which, although well suited to local conditions, has only a limited market.

Some advance was made in establishing the Tunduru (Southern Province) flue-cured tobacco farmers, but progress was hindered by the poor climatic season, coupled with the fact that barns were not ready and experience was lacking in the technique of flue-curing. A Tobacco Officer was posted to the district during the year to assist this developing industry. Fire-cured tobacco is grown in the Songea (Southern Province) Biharamulo (Lake Province) and Kibondo (Western Province) Districts. Production in the Southern and Lake Provinces was again smaller during the year than in the preceding season.

The Songea fire-cured tobacco industry is passing through a very difficult time. Climatically, there have been two bad seasons, but there appear to be other reasons for the severe fall in production, which has occurred to such an extent during recent years that drastic measures have had to be taken in order to reduce the overhead charges to a level which the present crop can carry. The 1953 output of 242 tons of leaf cannot carry the expenses of field management and the processing costs of a crop which was once 1,185 tons.

A somewhat similar situation is to be found in respect of the Biharamulo industry where the lucrative returns which tobacco growers can obtain by selling their leaf in the form of coil have again seriously reduced the quantity of leaf available to the packing factory which draws its supplies from Biharamulo and Kibondo Districts. In the latter, affairs in the field are more satisfactory, for growers marketed eighty-two tons of leaf as compared with fifty-six tons from Biharamulo.

It is hoped that propaganda among the growers, designed to induce support for their own organizations in the form of greater production and delivery of leaf *per capita* will enable better prices to be paid and will thus break the vicious circle which is affecting the popularity of tobacco cultivation.

The Songea industry which is, in effect, the Ngoni-Matengo Native Co-operative Union, markets its leaf through the Songea Native Tobacco Board. The high grades are sold in Liverpool and the balance in East Africa. The Nyamirembe Tobacco Board disposes of the Biharamulo and Kibondo crop to a tobacco company in East Africa on a three-year contract.

The following table shows flue-cured and fire-cured tobacco deliveries by growers during the last few years:—

Flue-Cured Tobacco (lb.)

Area	1949	1950	1951	1952	1953
Iringa ...	1,710,816 ...	2,863,058 ...	2,736,190 ...	2,290,087 ...	1,995,325

Fire-Cured Tobacco (Tons)

Area	1949	1950	1951	1952	1953
Songea	888	1,275	604	400	242
Nyamirembe ...	143	182	210	188	138
Total ...	1,031	1,457	814	588	380

A considerable tonnage of leaf in various parts of the Territory continues to be grown for local consumption and sale as coil, snuff and cake to neighbouring Territories.

Investigational work on tobacco at the Department's Igumbiro (flue-cured) Tobacco Station, carried out by the Agricultural Officer (Experiments) is described in Part II of this report, and marketing arrangements are referred to under the heading "Marketing and Grading of Produce".

Tea

The acreage under tea continues to increase and new areas came into bearing. In Mufindi there was a record crop and the factory had some difficulty in dealing with it, a situation which will be met by the second factory now being completed. In Rungwe, also in the Southern Highlands, another new factory approaches the production stage in time to receive the crop which will soon mature.

In the Usambara mountains two new factories opened for production. Here also although dry weather early in the year affected output, both the young and mature tea revived with rains in September.

The present acreage under tea in Tanganyika is now 10,517½ acres of which 6,893½ are in the Southern Highlands Province.

The following table shows the reported production of made tea during the last few years:—

(Weight in lb.)

Year	*Tanga*		*Southern Highlands*	*Total*
1949 ...	452,000	...	1,001,132 ...	1,453,132
1950 ...	473,864	...	1,274,808 ...	1,748,672
1951 ...		... 2,383,391 ...	...	2,383,391
1952 ...		... 2,462,601 ...	...	2,462,601
1953 ...	800,449	...	2,020,796 ...	2,821,245

Wheat

In the Northern Province where the bulk of the Territory's wheat is grown a record crop was anticipated but, due to weather conditions and to extensive bird damage in the Moshi District, where it is estimated that 1,000 tons were lost due to birds, the crop was less than that of last year.

Native production in the Southern Highlands Province was also lower though it is difficult to assess annual production, as much of the crop is disposed of by barter and sale outside the markets. Encouragement is being given to expanding the production of wheat especially in the higher and colder areas which are not suited to the growing of maize.

Despite climatic conditions, the native crop in the Southern Province showed an increase over the previous season.

The investigational work on wheat varieties, cultural methods and manuring continued under the Agricultural Officer (Experiments) in the Southern Highlands Province, and a report of his work appears in Part II of this report.

The reported marketed tonnages of wheat in recent years are given below:—

	Tons				
Province	1949	1950	1951	1952	1953
Northern	4,550	7,475	4,902	4,465	4,301
Southern Highlands ...	95	361	380	246	66
Southern	425	203	542	553	600
Western	64	13	11	—	7
Total ...	5,134	8,052	5,835	5,264	4,924

MINOR CROPS

Barley

Barley, which is less attractive to birds while there is a supply of awnless wheat available, is grown in the Northern and Southern Highlands Provinces. In the former province, some 2,500 acres were planted during the long rains, mainly in the Kilimanjaro and Ol Molog areas. An average yield of five bags per acre was obtained, and 1,072 tons were sold during the year. Some of the Swedish varieties are becoming popular for the higher areas. In the Southern Highlands Province, barley is grown in the Poroto Mountains, mainly as a cash crop for sale to local farmers as pig feed, and is of little domestic importance to the African growers. Production was slightly less than in the previous year, and seventy tons were marketed compared with one hundred tons in 1952.

Beeswax and Honey

The production of this valuable export commodity was 672 tons as compared with 599 tons in the previous year, and there has been a notable improvement in the quality as a result of supervision and propaganda carried out by the Beeswax Officers stationed at Tabora and in the Southern Province. In two districts of the Western Province a number of beekeepers associations have been formed with the object of dealing direct with shippers at the coast. They are also taking some interest in packing good quality honey but this cannot be regarded as a promising business in face of the high value of the inferior grades used for native beer making.

The Annual Report of the Beeswax Officer will be found in Part II of this report.

Cinchona

Production in the Usambaras is declining. The market was very quiet throughout the year, and only one estate was in production. Three tons were produced as compared to fifty-three tons in 1952.

Derris Root

Production was confined to one estate; four tons were marketed.

Essential Oils

Bitter orange oil from one estate in the Tanga Province produced 7,000 lb., an increase on the 1,988 lb. on 1952 production. In Uwemba (Southern Highlands) some fifty acres of geranium were cultivated and from this about 200 lb. of oil is believed to have been produced. Five acres of *Eucalyptus citriodora* were grown and 110 lb. of oil were distilled.

Spices

Sixty-five tons of chillies were produced in the Northern Province during 1953, an increase of ten tons on the previous year, and five tons were marketed in the Tanga Province. There was a considerable increase in the production of coriander seed and ten tons as against one in 1952 were marketed. Two tons of black pepper were produced from one estate in the Tanga Province, and production of this crop should increase as nursery-grown vines have been distributed to Africans who are showing keen interest.

Palm Oil

Compared with 1952 both palm oil and palm kernel sales at markets in the Kigoma District of the Western Province have shown increases of 27 and 162 tons respectively. Prices for palm oil fluctuated between Shs. 1/50 and Shs. 1/90 per kilo with an average of Shs. 1/76 and for kernels 80 cents per kilo.

These sales are the highest recorded to date but it is believed that the figure for kernels has been swollen by the sale in local markets of kerne ls brought across from the Belgian Congo. At the Simbo Oil Palm Nursery demonstrations of inter-cropping correctly spaced palms with annual crops continued. A consignment of Malayan dwarf oil palm seeds was planted out in nurseries.

Recorded sales during the last five years were:—

	Tons				
	1949	1950	1951	1952	1953
Kernels	240	225	370	334	499
Palm Oil	26	56	60	35	64

Cacao

Six tons of cacao were produced on one estate on the Sigi River in the Tanga District of Tanga Province; an increase of four tons over last year's figure.

Kapok

Good harvests and satisfactory prices were obtained in the Eastern Province and production rose above that of 1952. There was also a considerable increase in the Tanga Province and free distribution of seedlings has been made by non-native planters to interested Africans who sell the kapok to the supplier. Seven hundred and sixteen tons were produced as compared with 343 tons in 1952.

Gums (Arabic and Copal)

The collection of gum arabic in the main producing Provinces (Western, Lake, Central) showed an increase over last year. This trend is usual in a poor crop season and it is a useful one in that it puts ready cash into the hands of collectors in food shortage areas.

The following table indicates recorded sales during recent years:—

Province	1949	1950	1951	1952	1953
			Tons		
Central	115	265	85	61	97
Eastern	36	68	16	14	5
Lake	272	614	245	148	232
Western	275	638	228	206	373
Southern	21	23	5	—	3
Total ...	719	1,653	579	429	710

Rubber

One estate in the Eastern Province has 176 acres of Hevea rubber. Its production was nineteen tons as compared with twenty-one tons in 1952, and twenty-eight tons in 1951.

Betel Nut

The increase in the planting of betel nut along the Pangani River in the Tanga Province has been maintained. The crop is easy to harvest and handle, and production should soon increase substantially. Kiln drying is being advocated in order to obtain better quality. Production amounted to seventy-one tons.

Onions

The Northern Province crop was below average due partly to a decrease in acreage planted, but in the main to dry weather conditions. Areas normally planted under irrigation in the Mbulu District were planted to food crops to meet the needs of the anticipated food shortage. In order to stimulate production and to bring sulphate of ammonia into use, arrangements are being made to sell this fertilizer in ten-pound bags. The Department continued its practice of importing onion seed from India and distributing it to all districts where there is a sale for it.

The following table indicates reported marketed tonnages in recent years:—

Province	1949	1950	1951	1952	1953
			Tons		
Northern	2,191	1,320	1,265	1,763	1,460
Eastern	150	263	174	134	157
Central	158	640	924	261	200
Lake	144	148	38	2	—
Total ...	2,643	2,371	2,401	2,160	1,817

Sweet Potatoes

This crop is, though not regarded as a staple, widely grown throughout the Territory where conditions are suitable for it, and in view of the general shortage of cereal food, African cultivators were urged to extend the area under sweet potatoes using all such swampy places as would produce an emergency crop.

European Potatoes

Good acreages were maintained in the hills of Lushoto District in the Tanga Province and seed of the blight-resistant variety 1521C(3) was distributed from Kungului farm for planting by peasant cultivators in the mountains.

In the Southern Highlands production, chiefly in the Poroto Mountains, exceeded demand but, while the marketed figure shows a decrease from last year, the total sold may have been as much as, or more than, in 1952. A good deal of this crop is sold outside the markets. One hundred and ten tons are recorded as having been exported to Northern Rhodesia. Late blight continues to take a heavy toll in this area also, and the success of the above-mentioned variety if it were introduced into general cultivation would be followed by its propagation in the Southern Highlands.

Reported marketings in 1952/53 were as follows:—

	Tons	
Province	1952	1953
Tanga	150 ...	300
Northern	345 ...	340
Central	15 ...	10
Eastern	105 ...	32
Southern	26 ...	22
Southern Highlands	1,155 ...	1,013
Lake	84 ...	—
Total ...	1,880 ...	1,717

Vegetables

The coast towns are largely supplied by the highland areas of Usambara, Uluguru and Iringa where African and non-native farmers, engage in this form of production. For instance, the Lushoto District dispatched 683 tons of vegetables for consumption in Tanga and its neighbourhood and 300 tons came to Dar es Salaam from Iringa, partly by air and partly by road and railway. East African Railways provided an insulated truck for this service.

Fruit

Citrus Fruit.—The orange crop in the main orange growing area, which is centred around Muhesa in the Tanga Province, had an almost complete failure of its fly crop. This amounted to some fifty tons only. It was nearly all sold as fresh fruit.

The main crop of 770 tons was of the same order of quantity as for the previous year. Formerly a packing and juicing plant at Muhesa had operated for the Native Authority, but during the year under review the agent relinquished this service in favour of a new company intending to work on its own account. It is estimated that 12,500 gallons of orange juice were produced.

The average price paid to growers per 1,000 lb. of fruit was Shs. 30/- as against Shs. 17/56 in the preceding two years.

Lemons, tangerines and grapefruit, which are also grown in the Muhesa area and in other favourable parts of the Territory, yielded fairly well. The tonnage of oranges produced at Muhesa during recent years is shown in the following table:—

	Tons
1949	1,204
1950	1,780
1951	422
1952	739
1953	820

Other Fruits.—The Pangani District of the Tanga Province found considerable difficulty in marketing its banana crop. In past years, most of the crop was shipped to Mombasa, but prices obtaining there during 1953 hardly paid for the transport. Efforts are being made to dispose of the crop on other parts of the coast. Close watch was kept on river plantations for any outbreak of banana wilt, but no signs of this were observed. Exports during the year were 529 tons compared to 860 tons in 1952 and 1,250 tons in 1951.

During the year, smooth cayenne pineapple suckers, imported from Kenya, were planted in various parts of the Tanga District. Plantings in light, sandy soils made poor growth and it was found that, unless sulphate of ammonia is applied at the rate of 4/500 lb. per acre, growth is very slow and the plants are inclined to yellow. Canning trials have had mixed results. Trials continue but planting by Africans is not being encouraged until the future of this fruit is more certain.

Passion fruit juice production from the plant at Lushoto in the Usambaras amounted to forty-seven tons as against twenty-four tons in the previous season. The company grows part of its requirements, but purchases the bulk from African growers. Prospects for next season's crop are good.

Colombo Root (*Jateorhiza Palmata*)

There was a revival in the export of this crop, the trade in which had been almost killed by deliveries of weevil-infested root. Rejection by importers in the United States brought this matter home to local exporters. Improved quality, and the African needs for money in food shortage areas resulted in the increase indicated below. Exports in recent years have been:—

	Tons
1951	93
1952	12
1953	177

PRODUCTION COMMITTEES

These committees, which are established under the authority of the Crops (Increased Production) Ordinance continued to operate successfully in the Districts of Arusha, Moshi and Mbulu (Northern Province), Morogoro and Kilosa (Eastern Province) and Iringa (Southern Highlands Province). As hitherto, they discussed matters of local importance and brought them to the notice of Government through the submission of minutes of their meetings to the Director of Agriculture.

Their chief function however was, as usual, to advise upon the issue to individual farmers of the Planting Orders, which carried with them the guaranteed minimum returns of Shs. 100/- per acre of maize or wheat planted. A measure of the disastrous growing conditions for cereal crops was the fact that a total sum of £85,570 was required to meet the guaranteed minimum return claims for the 1953 season.

As a temporary expedient for meeting the increased costs of mechanized agriculture, a maize ploughing bonus was introduced for all maize and white sorghum grown in blocks of not less than twenty acres on land which had been mechanically ploughed. The bonus payable was Shs. 20/- per acre. The administration of this scheme fell to the Production Committees. A total of £68,776 was paid out.

MECHANIZATION AND MECHANICAL PLOUGHING SCHEMES

Mechanical ploughing schemes in the Eastern, Lake, Southern and Central Provinces have reached a critical stage. In some areas there has been an increased interest shown by cultivators, whilst in other areas, the demand for this service has not been maintained. In the Eastern Province all Native Authority sponsored schemes, excepting that in the Rufiji, have been closed down owing to a lack of interest or from economic causes. While this has been recognized as a retrograde step, and it is unfortunate that Native Authorities have found it impossible to continue subsidizing small tractor ploughing schemes, the scattered nature of these pilot ventures and the operation of tractors or a ploughing programme that would not keep the machinery fully occupied are factors which obviously cannot be allowed to prevail indefinitely. The staff charges and the depreciation are too high under these conditions.

The schemes which so far show most promise are those in the rice growing areas such as the Rufiji and Ruvuma Valleys and in the Lake Province where large areas of open grassland with few obstructions demand little or no prior clearing work.

The Rufiji ploughing scheme made a late start in 1953, due to the late harvest, insistence on payment of ploughing fees in advance and the delay in the return of four tractors that had been sent in for a complete overhaul. However, by working two shifts per day (and this was found to ensure better supervision of the work), a final acreage of 5,350 acres was achieved, all of which had been paid for in advance. This was accomplished with never more than six tractors in operation at any one time. The standard of ploughing showed an improvement on previous years, to the satisfaction of the cultivators. It is considered that the production of paddy has increased as a result of this scheme and the African who now appreciates it is beginning to find it necessary to his way of life. Nevertheless, constant propaganda has to be undertaken to obtain full co-operation from the cultivators, and although the charge for ploughing has been raised to Shs. 40/- per acre, the scheme is not likely to become solvent unless more land can be dealt with. Assuming two shifts a day, a six-day week, and loss of time due to breakdowns and moving camp, it is considered that a maximum of 10,500 acres could be ploughed with the eight tractors attached to the scheme during the four months from August to November.

The Lake Province Cotton Committee, which continued to manage mechanical units in that Province, decided during the year to postpone operations of the unit at Koromije and to concentrate on the Jojiro scheme. The scheme offers a ploughing service which is chiefly concentrated in the open drainage areas, and a ridging service which operates on the sandier soils of the higher land. The agricultural calendar is such that, in general, the ridging follows the lowland ploughing and the use of tractors is extended over a seven- or eight-month period.

In order to make this scheme as efficient as possible only that number of tractors and implements sufficient to deal with the present demand for mechanical cultivation, were operated. The balance of the machinery was laid up or put to other work. During the first six months of the year 775 acres

were cultivated by tractors operating from both Jojiro and Koromije and in the latter half of the year 1,770 acres from the former only. The gap between revenue and expenditure has been narrowed to an appreciable extent, and it is felt that by still more efficient use of machinery this gap can be closed. The ultimate success of the scheme depends on an increased demand from the cultivators, as the tractors do not yet work to their maximum. There is no doubt that the demand for mechanical cultivation is there, and that the peasant farmer is appreciative of this service. The amount of work undertaken has been doubled since last year, and the African has been willing to pay up in full, even in a year when there has been a marked shortage of cash.

In the Ruvuma area of the Southern Province, due to drought conditions, the mechanically ploughed fields gave a negligible return. A total of 1,634 acres in three districts was ploughed. For the 1953/54 season, 550 acres only were ploughed, all in the Newala District, as there was some reluctance to pay fees.

In the Singida District of the Central Province the three ploughing schemes, managed by Africans, continued to operate, each with a medium powered tractor. The area under crops has been increased. Although the stated object of these schemes is to build up food reserves, they will not operate successfully unless they can pay their way, and it will be necessary for them to produce high value cash crops as well as staple food crops, in order that each scheme shall be on a sound economic footing. Considerable care and attention needs to be given to these schemes, the capital for which has been raised by private or public subscription, and without recourse to loans from either Government or Native Authorities. Sound agricultural practices, and anti-erosion measures will have to be integrated as a part of each scheme.

In the Pare District of the Tanga Province, a successful mechanical ploughing scheme ploughed a total of 1,300 acres for maize. This acreage which was ploughed by a contractor was an increase of nearly 100 per cent over any previous year. Further ploughing is proposed for early 1954 for the main rain plantings.

GOVERNMENT FOOD FARMS

Lupiro/Kivukoni

The full-scale pilot schemes, which are designed to ascertain the practicability and the costings of rice production in the Kilombero Valley, have shown very promising results. In the 1952/53 season, 190 acres of paddy were planted at Lupiro, the centre where the workshops and stores are maintained, and a further 195 acres in the river valley at Kivukoni. Further expansion is taking place in the latter area for the coming season. All operations from ploughing to combine harvesting are done mechanically, and detailed cost accounts are maintained. Despite a forty-day rainless period after sowing, a final yield of some 2,128 lb. per acre of paddy, compared with 1,635 in 1952 was obtained. This, after full depreciation, interest on capital and full European salaries and passages, represents a profit of £5 per acre.

A fuller account including records of seed rates, fertilizer and herbicide trials appears in Part II of this report.

SOIL CONSERVATION

The report of the Chief Soil Conservation Officer is printed in Part II of this report.

The year 1953 was largely one of consolidation of the Soil Conservation Service, improving the efficiency of the mechanical units, and expanding the advisory services. The tractor teams worked with very little hindrance from mechanical breakdown and were thus enabled to put up a much improved performance on field protection work than in the previous year. In addition to the mechanical units maintained in the Northern Province five terracers continued to be available to those farmers in the Southern Highlands Province who wished to carry out conservation works using their own tractors. During the year, over 1,630 acres were terraced and fifteen and a half miles of diversion ditches were constructed. Twenty-four dams and haffirs with a total capacity of 60,000,000 gallons, and involving 61,344 cubic yards of earth moving, were dug. A group of African surveyors were trained during 1953 to undertake topographical and contour surveys on individual farms or settlement areas. Eleven Departmental Officers attended a month's course at Tengeru, the Soil Conservation Service Headquarters.

In the Lake Province great emphasis was laid on the role played by good farming practices such as manuring, tie-ridging, the reservation of hilltops in the conservation of the soil. A large field staff is employed in this area and in the country which is now being opened up for African settlement with the purpose of putting across these simple measures to the individual cultivator. In Sukumaland, there was as usual a large programme of dam building. Five dams were completed with the aid of the mechanical unit operating from Malya and twenty-two hand-built dams were dug. There was an increase in hand-built dams in the east Lake districts. In the Tinde–Usanda reclamation area of Shinyanga District, which was closed to all grazing until August, tie-ridging of all fields was insisted upon, and all cattle tracks were marked out and sisal planted to demarcate gullies. Similar work was carried out in Kwimba District on certain badly eroded areas, and again these were completely closed to grazing, 100 per cent tie-ridging enforced and special guards employed to keep stock away from these areas. The results of both these schemes were remarkable and show what can be done by strict control, and the exclusion of cattle. They also show the remarkable powers of recovery of Sukumaland soils.

Reference to soil conservation works carried out in the Eastern Province will be found under the heading of "Land Usage Schemes." Throughout the Central Province work has gone ahead steadily and included projects such as dam building, contour banking, gulley stopping and the planting of windbreaks. Six hundred and sixty miles of contour banks were constructed by communal labour and a total of twenty-six new dams and haffirs were dug and a number of old ones repaired or cleaned out. Gulley stopping with brushwood was carried out over some 2,000 acres in the catchment area of the No. 2 dam at Dodoma, and the benefit of this work was apparent from the amount of silt and sand that had accumulated behind the barriers after the first rains in December. Overstocking with cattle, sheep and goats is a serious problem in this part of the country and it is Government's policy to

encourage sale of stock for the purpose of relieving pressure on the grazing. The prevailing food shortage both for beast and man helped the latter in his decision to part with livestock and a good cull was thereby achieved.

Tie-ridging continued to be the policy in the Southern Province except in the Matengo Highlands of Songea where the traditional "pit" system is maintained. Advice on soil conservation measures was provided for the new tobacco farmers in the Muhuwezi–Mtetesi area.

In the Western Province, the poor rainfall demonstrated the advantages of tie-ridging on soils not subject to water logging, though cultivators tend to ascribe the good results not to the method, but to the working of Providence. Nineteen new dams and haffirs were constructed during the year.

The demand on the services of the Soil Conservation Unit in the Southern Highlands Province continued, and the Agricultural Officer (Soil Conservation) stationed at Iringa continued to advise farmers on arable layouts, grass leys, irrigation furrows, contour banks and other works. He also toured the Province, assisting with land usage surveys, routine anti-erosion measures and with advice on the maintenance and improvement of fertility on African lands. The results, in general awareness of the problem and in practical measures undertaken, have been satisfactory and there is a useful record of contour banking, wind-break planting, and gulley stopping from several of the districts.

In the Northern Province, the use of trash bunds has proved very popular both in the Moshi and Mbulu Districts, and the system is proving to be very suitable on the gentler slopes. Widespread results have been achieved and in some areas it is now difficult to find African-cultivated land that has not been trash bunded. In some cases, bench terraces have been formed where trash has been laid on the same lines for three successive years. There is no doubt that this system has come to stay in the Northern Province, particularly in those areas with loose powdery volcanic soils.

Reference to soil conservation work in the Tanga Province is dealt with under the heading of "Land Usage Schemes".

LAND USAGE SCHEMES

This Department remains closely connected with several undertakings, all of which have the object of better land use in the widest sense of the expression, and in the following paragraphs some account is given of the progress made during the year, of some of the more important of these schemes. A number of officers of the Agricultural Department are attached to them and work on them in close co-operation with the Provincial Administration and officers of the Natural Resources Departments. The work of these schemes is fully reported upon in detail by their Executive Officers to the Provincial Commissioners concerned.

The following information taken from the annual report of the Uluguru Land Usage Scheme serves to illustrate the progress made. Changes have been made in the emphasis of this work in the Uluguru mountains (Eastern Province). At the beginning of the year a two and a half weeks' course was held for European staff on the scheme and for officers from the various departments concerned, together with representatives from the Missions.

Native Authorities and schools, etc., so that everyone who was working together for the benefit of the area was imbued with the same ideas. This was followed with a course on "Training Within Industry" for a few selected officers. Subsequent courses for subordinate staff and abbreviated courses, referred to as "bush schools" were held in almost all village headmen areas. The outcome of this educational pressure has been a far more lively interest in the scheme by the Waluguru themselves, and the output of work has increased considerably. This would indicate that one bush school, lasting three days, is of more value than a succession of "barazas". Some of the best results have since been achieved in those areas most recently tackled. Starting in the Mgeta area, where soil fertility is dangerously low, the construction of compost heaps has spread with considerable success and progress with terracing and bunding has been made in various degrees depending largely on the personal influence and the degree of understanding of the village headman or clan leader concerned. Special instruction for these men is being undertaken.

Two new methods have been introduced this year in connection with the work of terracing. A home-made form of line level, manufactured for a few cents, is proving popular and these are in demand by village headmen, teachers and others. The technique of terrace construction has been altered and work now begins at the bottom terrace of the field, enabling vegetation and top soil from the terrace above to be spread in each case on the terrace below. With the top soil evenly spread over the surface of the terrace, the depression of crop and the back terrace effect has been considerably reduced, and the adverse psychological effect on cultivators eliminated. Trash bunding has continued on an increased scale, some 167 running miles being completed. The figure for terracing was 1,690 running miles, equal to about three and a half square miles.

Tree planting was undertaken on a somewhat smaller scale in order to permit a better supervision and care in planting. This resulted in a greatly improved rate of survival of the young seedlings. The main types planted were wattle, cyprus and gum in the higher areas, and cassia in the lower areas, and the total area has now reached 695 acres. A considerable quantity of kapok, cloves, coconuts, oranges and cashewnuts were also planted. The distribution of coffee seedlings, now handled by the Native Authorities, has greatly increased.

The cinema projector and pocket slide viewers were in constant use throughout the year, and the resultant interest shown by audiences, and soil conservation schools in these "visual aids" has been extremely encouraging. A new District Newspaper has also proved invaluable in circulating fresh ideas. With few exceptions, the native authorities are still not taking as full a part in the work as is desirable. An improvement however has been shown since last year, and it is believed that with further intensification of education in soil conservation matters, together with the new system of bonuses for extra efficient village headmen, the situation will continue to improve.

During the year under review, further progress has been made in the Usambara Scheme. In the hill areas, tie-ridge cultivation has made good progress and ridging is now being carried out in 75 of the 122 sub-chiefdoms. In all, 7,459 plots were completed. Progress is also reported on the withdrawal from annual cultivation of all land with slopes greater

than twenty-five degrees. Due, however, to the high percentage of land in the Usambaras falling into this category, it is not possible, without too great hardship, to make this withdrawal simultaneous. De-stocking was postponed, but there is now a large number of demonstration stall-feeding byres scattered over the Usambaras. More than fifty per cent of the people in the Western Usambaras are now cultivating under the Usambara Scheme Rules and there is a better understanding of the purpose of these rules. A vigorous and unmistakable lead from the local native authorities is essential for its continued success.

Large-scale mechanical cultivation was abandoned in the Usambara plains areas, as there was little popular demand on the part of the peasant cultivator. The agricultural investigations in many of the proposed expansion areas within the district, which it was hoped to develop by irrigation and drainage, have shown that the salinity of the soil is at a level that makes irrigation without leaching impracticable, but it is now considered that many of the soil leaching trials in rice cultivation are sufficiently advanced to warrant the development of irrigation agriculture under properly designed irrigation control.

The Sukumaland Development Scheme has its headquarters at Malya, where agricultural staff were posted throughout the year as part of the team of officers who work solely in connection with the land utilization problems of Sukumaland. The two most important of these problems are the heavy over-population, and the over-stocking with cattle and goats, which make it necessary to provide for the movement of people into new country. The objects of the scheme are, therefore, to make it possible for Africans and their livestock to live in areas which are at present in the grip of the tsetse fly, and after making provision for domestic water supplies, to see that the potential carrying capacity of the land in terms of humans and animals is not exceeded. Field Officers continued to conduct surveys with this object in view. Three hundred and sixty-two new parish councils which control the ingress into expansion areas were established. New expansion areas were opened in Geita District, dam-making made further progress, and substantial areas of bush were cleared and made available for settlement in Maswa and Shinyanga.

The five-year plan for the development of Mbulu District in the Northern Province ended in December, 1952, but the work of improved land usage has been continued on a reduced scale, financed by the Native Authority. It was unfortunate that in the first year after the official plan had ended the district should have had such a bad drought, and that the clearing of tsetse bush had to be temporarily discontinued for reasons connected with the food supply. Other works however were continued, and these included the construction of irrigation furrows, dam construction and the making of roads. The irrigation furrow commands an area of 380 acres in the first instance and carries a flow of twenty cusecs of water. Two hundred acres of this were planted to maize and have done extremely well, and there are great possibilities for extension.

Expansion areas for African settlement in Kingori, Ongadishu, Muriet in the Arusha District, in Uru Chini of the Moshi District, Ukerewe in the Lake Province, and in a number of other places were also the subject of advice and assistance from this Department.

VERMIN, INSECT PESTS AND DISEASE

Vermin, pests and disease took their usual toll, though losses this year, largely on account of dry weather conditions, were not unduly heavy.

The damage by grain-eating Diochs (*Quelea quelea*) which in 1952 was particularly widespread in the northern, western and central areas of the Territory, was confined almost entirely to the wheat areas of the northern and north-western slopes of Kilimanjaro. Farmers incurred very heavy losses of wheat and barley in both the short season crop and in the main crop in July/September.

Depredations of this species are becoming widely reported from many African countries and have been increasing in frequency in Tanganyika since 1944. Knowledge of the biology and habits of *Quelea* in the Territory is very scanty and a Zoologist with an ornithological background was appointed in July to investigate their habits and to experiment with and devise control methods. Major success in destruction of dense roosts was obtained towards the end of the campaign in September by a combination of explosives and inflammable oils. Some success under specialized roosting conditions had been obtained in earlier trials of spraying molasses, initiated by farmers in co-operation with officers of the Department. Chemical methods of control are under investigation in the United Kingdom.

Nesting areas used in 1953 have been discovered in parts of the Central Province in semi-arid and isolated areas. These are under observation with a view to investigating control methods for nesting colonies should they be used again in the coming breeding season.

In the following paragraphs mention is made of some of the pests, diseases and vermin that were encountered during the year.

From the Northern Province it is reported that the white stem borer, which is now found at much higher altitudes than was previously the case, is becoming a real menace to estate coffee. Thrips in coffee caused defoliation on Kilimanjaro and this, coupled with lack of rain, increased the amount of "buni" as the trees were unable to carry the crop. Maize stalk borer and banana weevil also caused crop losses.

In the Tanga Province, cotton stainers caused greater damage in all areas than in the previous season and maize stalk borer was widespread, particularly in the irrigated areas of Pare District. On the other hand, the low rainfall in the Lake Province was offset by the low incidence of pests and disease. Two thousand and two hundred tons of U.K. 48 cotton seed were dusted with Perenox as a measure against black-arm disease. A temporary Crop Supervisor, appointed by the Lake Province Cotton Committee, was engaged on poison baiting, mainly against porcupine, and enthusiastic reports were received from cultivators.

The Eastern Province reported considerable damage to cotton by stainers and American bollworm in the Kilosa District, and the coconut sucking bug (*Theraptus* spp.) which is widely distributed on the coastal belt, continues to be responsible for serious annual losses. Considerable damage to maize and rice was caused by an outbreak of army worm in the Wami Magole area, but this pest was controlled by the use of D.D.T./B.H.C. dust. Several successful poisoning campaigns were conducted against vermin, but that in

the Lake Province against baboon, which had started with great success, had to be discontinued as staff were required for famine relief work. As an instance, however, of what can be achieved it is worth mentioning that 1,375 baboon, pigs, and monkeys were accounted for during an anti-vermin campaign in the Morogoro District.

In the Southern Province, rosette disease caused severe reduction in the groundnut crop, and a new species of *Helopeltis* was found on cashewnut trees, causing the death of young nuts. Excellent progress was made in vermin destruction and incomplete tail counts showed that over 2,600 pig, baboon and monkey were killed.

As in the Northern Province, the Southern Highlands Province is actively concerned with the control of the white stem borer of coffee; the main coffee pest of the Province. Stem rust in wheat was severe in Iringa District and some damage to tobacco by cutworm took place during the early growing season.

The Western Province reports damage by the maize stalk borer, thrips in onions and rosette in groundnuts. Cassava mosaic continues to be the most prevalent and damaging disease in the Province. The Territory remained free from locust invasion or outbreaks until November, when a few scattered swarms of Desert locusts were reported from the Lake and Tanga Provinces. At the end of the year, the threat of a heavy and early invasion by Desert locusts from the north developed.

The following brief accounts indicate some of the work undertaken by the Department's Entomologists and Plant Pathologist. The full reports of their work are printed in Part II of this report.

The Entomologist, Morogoro

Trials on underground pit storage of maize were brought to a close in 1953. Complete elimination of the weevil population by the accumulation of respiratory carbon dioxide occurred in all three pits, where the storage periods were 379, 446 and 466 days respectively. Apart from a loss of two tons of grain due to a constructional fault, the maize at the end of the trials from all pits was in a very satisfactory condition and considerably better than maize stored in bags in the conventional godown. The practical utility of underground storage in Tanganyika can now be considered established. Pit storage trials with high moisture content maize are to be carried out.

Heavy infestations of army worm in the Eastern Province were brought under control by prompt dusting with a mixture containing ten per cent D.D.T. plus three per cent gamma B.H.C. Small grey field mice (*Mastomys microdon coucha*) occurred in plague numbers and caused damage in repeated maize and sorghum plantings in the Eastern Province. Extensive baiting with a barium carbonate/maize meal mixture had variable success, and it is proposed in future to experiment with baits containing Warfarin.

The Entomologist, Arusha

Much of the Entomologist's time was spent in identifying bean pests, assessing their effect on bean production and devising methods for their control. It has become increasingly apparent, however, that no single

widespread pest of beans exists in the Northern Province, but that every year the crop suffers losses from one or another of the pests which have been identified. Control of these pests by insecticides demands a good coverage of the bean pods themselves, which are always found beneath the leaf canopy of the plant. Normal straight boom spraying machines will not give the coverage required since most of the spray droplets are deposited on the upper surfaces of the upper leaves.

In the 1952 growing season it was impossible to adopt control methods against the sucking bugs since no spraying machines were available. In the 1953 season, however, many farmers purchased low volume sprayers for use primarily on weed control in maize. One such machine was adapted for underleaf bean spraying by making an entirely new boom and drop legs from half-inch diameter galvanized metal piping and spare jets. This enabled spraying above and between bean rows. This machine did excellent work during the 1953 caterpillar outbreak on many farms, applying approximately three-quarter pound of actual D.D.T. in fifteen gallons of emulsion per acre. It is considered that this spraying technique, with varying dosages of insecticides, will effectively control all the major bean pests. Comparisons of efficiency, however, are to be carried out with this machine and other types of ground sprayers, aerial spraying and dusting. Experiments and demonstrations on the control of stalk borer and cutworm have been arranged in Mbulu District. Two and a half per cent of D.D.T. powder or Derrisol placed in the funnel of each maize plant and a gammexane bran bait have been advised for stalk borer and cutworm control respectively on African holdings.

The Entomologist, Lyamungu Coffee Research Station

Work was carried out on the white coffee borer, *Anthores leuconotus*, which remained the most serious pest of coffee throughout the year, and which caused extensive damage. Both D.D.T. and Dieldrin were shown to be effective in borer control against the beetle and ring barking larvae. Tests were made with lacquers charged with insecticides and results have shown them to be very effective against this beetle, the insecticide still being active after nine months' exposure in the field. The possibility of using lacquers in the household on such articles as meat safes to control ants and cockroaches is being tested.

A pest new to the Pawpaw, *Tetranychus equatorius mac-y.* caused severe damage on one estate to young pawpaws in the early flowering stage. Complete control was obtained by two applications of lime sulphur concentrate diluted thirty times and to which three quarter pint of Teepol per forty gallons of diluted spray was added. The spray was applied at high pressure in order to penetrate the mites' webb. The mite was subsequently found in small numbers in almost all papain plantations, and it is probable that it is an indigenous pest. It is however, the first record on pawpaw and the second in Africa, the first being on cotton in Uganda.

Plant Pathologist

Banana wilt (Panama Disease) has been kept within manageable bounds by the destruction of infected plants as they are observed. The cleaning up of banana groves for wilt control has been extended to weevil control and

general renovation with very satisfactory results. The known total of definitely susceptible varieties of bananas in Kenya and Tanganyika is now six.

Owing to the exceptionally dry weather, rust disease on wheat was not a major problem but some increase was noted in the foot rots caused by *helminthosporium* and *fusarium* species. A disease of maize new to East Africa is brown spot, caused by *Physoderma maydis*. This was found at Moshi. *Polysora* rust of maize was seen in the coastal belt and near Moshi. Other diseases which came to notice during the year were a *nematospora* spot on cashew, a collar rot of budded citrus, a stem-pitting disease of citrus, and various rots on pruned coffee. Bark disease was noted as being of some significance on coffee grown in the Usambara Mountains. A scab disease of pawpaw, hitherto unrecorded, was seen to be caused by a new species of *Sphaceloma*. Its severity appears to be closely associated with humidity.

AGRICULTURAL EDUCATION

Departmental officers working in the field continued to spend much of their time in furthering "agricultural education", in one form or another. Informal discussions and demonstrations at schools, both in town and country, were held and assistance and advice in the laying out of school gardens was given. Other aspects of agricultural education are mentioned elsewhere in this report.

At the Ukiriguru Agricultural Training Centre twenty-two instructors and eighteen teachers completed the two years higher course, and twenty-two instructors the two years lower course. Thirty-eight instructors and twenty teachers completed their first year of training and forty-six instructors, five teachers and twelve Lake Province Cotton Committee instructors commenced their training. The intake for the new course towards the end of the year was slightly below normal, and vacancies were partially filled by the Lake Province Cotton Committee instructors. Indications are that the quality of the intake is about average.

During November, a recreation club was started at the Centre and is proving extremely popular. Apart from a temporary loan of a building by Government, all progress is being financed by the members, and there is no doubt that this amenity is proving well worth while.

Certificates awarded to those who completed their two-year course were as follows:—

	Certificate			
	1st Class	2nd Class	3rd Class	Pass
Higher class:				
Instructors ...	4	16	2	Nil
Teachers ...	1	12	4	1
Lower class:				
Instructors ...	2	17	1	2

A full programme of theoretical and practical instruction was maintained at the Indian School of Agriculture, Morogoro, and in addition to this syllabus a short course on soil conservation was provided when the students were taken on a visit to Tengeru. The students were also given the opportunity of widening their outlook by visiting a number of localities in the neighbourhood

where land usage schemes operate, and the Veterinary Department's headquarters at Mpwapwa. The number of students in residence was only seven, and after these had successfully completed their course only two applications were received for the next year's entry. The committee appointed by Government to review this position recommended that a new site for the school should be found, having not less than 500 acres of land suitable for mixed farming. When suitable land has been found it is proposed to re-open the school and to include in the course one year of practical instruction to be followed by two years of study.

FISHERIES ON LAKES AND RIVERS

The Department's motor fishing vessel *Sangala* after being on the slipway in January for routine care and maintenance was in continuous service until December, when it became necessary to lay her up for re-decking.

The Lake Tanganyika "dagaa" fishery was only moderately successful during 1953. High winds kept shoals away from the shore during the dry season and stormy weather often coincided with the best periods of night fishing. During the year 1,042 tons of dried "dagaa" left Kigoma. Production, some of which was marketed by other routes, was probably not less than 1,300 tons, equivalent to 4,000 tons of fresh fish. Experimental fishing by trawling, trolling, seining and various types of gill nets was carried out. Improvements were made in the field of seining by attracting the "dagaa" with the aid of 300 c.p. pressure lamps, fitted with reflectors, which are suspended from the canoe. Greatly increased seine catches have been made by this method and it was particularly successful with Nile Perch or Sangala. A large number of fishermen in the northern sector of the lake are now using lamps.

Experiments have shown that for Lake Tanganyika there is no need at the present to impose any restrictions on the size of mesh used with gill nets, as nets of each size catch a wide range of various species of fish. There are great possibilities in the use of nylon and other synthetic fibres such as Terylene for making nets, as these have been found to be more efficient, durable, and with a longer life than flax nets. There is a ready demand for nylon nets, and arrangements have been made for such nets and twine to be on sale in Kigoma early next year. Gill nets offer the best prospects for the expansion of a native fishery for species other than "dagaa".

The Malagarasi swamp fisheries continued to contribute a considerable quantity of smoked fish for Territorial consumption and for export to the Belgian Congo. Supplies of fresh Tilapia were also produced for local consumption in the Western Province. There were no new developments on the swamps and rivers during the year.

The Lake Rukwa fishery remained open during 1953, though the poor rains failed to replenish the Lake to its former level. The combined efforts of the European licensee and the native fisheries of Southern Rukwa yielded a year's catch of at least a million "ngege" (*Tilapia rukwaensis*) equivalent to some 300 tons of fresh fish, and with an estimated value of £10,000. A considerable tonnage of catfish was also handled.

Experimental gill netting revealed the presence of large stocks of several species of fish of economic importance which are not at present being utilized.

A preliminary survey of the Kilombero River fisheries in the Ulanga District indicated that this river appears to carry abundant stocks of fish of many species; that these fisheries, with an output of half a million fish, would be capable of considerable expansion, but that they are limited by the flooding that occurs, the considerable number of crocodiles and the jealously guarded system of native fishing rights in force at present. The Annual Report of the Fisheries Officer (Inland Fisheries) is printed in Part II of this report.

Marine Fisheries

The refitting of the *Patoni* which started in November, 1952, continued throughout the year. Delays and difficulties were met with, but most of these were overcome, and it is hoped that with the completion of the cold room the *Patoni* will be ready for work at sea by the end of January, 1954.

The scope of experimental fishing was severely limited by the lack of a seagoing craft but, nevertheless, a considerable amount was carried out locally with nets, traps and line, using a small outboard dingy. Trawling, gill and trammel netting and hand lining was carried out in the Lindi area whenever the use of a harbour launch permitted. Operations were on too limited a scale to permit firm conclusions, though certain possibilities which are to be investigated in due course revealed themselves.

The M.V. *Patoni* has stern accommodation for a crew of five and a small cabin for the mate. The deck cabin permits accommodation for four. A trawl winch, driven by a 30–40 h.p. diesel motor and capable of taking 400 fathoms of steel warp on each of its two drums, was made locally in Dar es Salaam. The refrigerated fishroom has an estimated maximum capacity of two tons. The oil tanks hold 578 gallons and should enable the vessel to run for five days without refuelling.

An echo sounder has also been fitted and, when finished, the craft should have a range and versatility unusual in a ship of her size.

Visits were paid to Mafia Island, other islands to the south, Kilwa, Lindi, Mtwara and various villages in the Dar es Salaam and Bagamoyo areas.

The general impression is that the local fishermen, who are well adapted to local conditions, are unable to increase the supplies of fresh fish which are inadequate to meet present day needs. A major difficulty is their inability to operate for considerable periods due to strong winds. Experience indicates that fishing is poor during the south-east monsoon.

Fish Farming

Two additional ponds were constructed at the fish farming station at Korogwe; one of two acres and the other of four. The ascertaining of construction costs was the reason for the former, and the other, to determine whether larger ponds yielded larger fish. Korogwe experienced unusual weather conditions. Rainfall was very heavy for ten months. As a result, work on the ponds was made difficult, and the flood waters had the effect of lowering the pH of the ponds. It became necessary to harvest ponds when opportunity occurred and at somewhat irregular intervals. Yields however were maintained, and crops were sold locally including two consignments each of one ton to Handeni.

Rice growing in association with fish farming continued; fingerlings of *Tilapia melanopleura* were introduced into ponds when the rice was eighteen inches high. Yields were rather low but results show promise and the method must be put on trial again.

Training courses for Agricultural Instructors were again held, and considerable intelligence in acquiring the elementary principles of fish farming was shown by them.

Consignments of fish fry continued to be sent to many parts of the Territory by rail, road, air and sea. Consignments of *T. melanopleura* were also sent to Kenya and Mauritius and assistance was also given to Northern Rhodesia, Gambia, the Gold Coast and Israel. Arrangements were made to import *Tilapia mossambica*, said to be suited to high altitudes, from Southern Rhodesia.

COUNCILS, BOARDS AND COMMITTEES

The present Director of Agriculture is a nominated official member of Legislative Council. He is Chairman of the Coffee Board, the Cotton Board, and the Seeds Board, and a member of the Livestock Board, Tea Board, Lint and Seed Marketing Board, the Tanganyika Sisal Board, the Central Advisory Committee on Nutrition, the Standing Committee on Grain Storage, and of the Management Committee of the Sisal Research Station. He is also a member of three inter-territorial bodies; the Agricultural Technical Co-ordinating Committee, the Central Tea Committee and the East African Marine Fisheries Advisory Committee. He attends meetings of the Pyrethrum and Tobacco Boards, and is a member of the Board of the Southern Highlands Non-Native Tobacco Growers' Union Ltd. The present Deputy Director of Agriculture is Chairman of the Milling Board.

The Regional Assistant Director of Agriculture, Arusha, is a member of the Coffee Board and the Seeds Board. The Senior Research Officer, Lyamungu, is a member of the Coffee Board. The Provincial Agricultural Officer, Southern Highlands, is a member of the Non-Native Tobacco Board. The Regional Assistant Director of Agriculture, Lake Province, and the Provincial Agricultural Officer, Western Province, are members of the Nyamirembe Native Tobacco Board, and the Provincial Agricultural Officer, Southern Province, is a member of the Songea Native Tobacco Board. The Regional Assistant Directors of Agriculture, Morogoro and Mwanza, are respectively members of their Provincial Cotton Committees.

Many officers of the Department are chairmen, members or executive officers of Provincial or District boards and committees concerned with crop production, marketing, land usage, water, etc.

CONFERENCES AND SHOWS

Departmental Conference

A conference of Senior Officers of the Agricultural Department was held in Dar es Salaam during March. It provided an excellent opportunity for the crystallizing and exchange of ideas on a variety of subjects. Amongst the subjects discussed at the conference were the following:—

Progress and problems of Mechanization, Next Steps in Soil Conservation, Produce Inspection, Agricultural Statistics, Grain-eating Birds, the Improvement of Peasant crops and the Experimental Programme.

The Rhodes Centenary Exhibition, Bulawayo

Agricultural products from Tanganyika, effectively displayed in the attractive Tanganyika Pavilion, were well represented at this Exhibition and considerable interest in them was shown. Exhibits included coffee, tea, seed beans, cashewnuts, pyrethrum, hides and skins, timber, tobacco and beeswax. The Director of Agriculture visited the Exhibition and was kept busy interviewing people who had thoughts of moving up to Tanganyika. Many of his inquirers were particularly interested in the prospects of tobacco, dairying and ranching.

Southern Highlands Natural Resources Show

The third provincial show, which was a great success, was held in Mbeya—for the second time—during two days in August. It was opened by His Excellency the Governor. The Agricultural Department exhibit attracted great interest, especially that of the soil conservation section with its models and posters. The very satisfactory attendance was estimated at 9,000 and there was an increase in exhibitors, which numbered some 1,000.

LEGISLATION

The following summarizes the principal legislation relating to agriculture enacted during 1953:—

Tobacco.—A Government Notice laid down that all Africans growing and producing tobacco in the Districts of Biharamulo, Ngara and Kibondo shall comply with any directions that may be made by the Nyamirembe Tobacco Board in respect of the sale of tobacco grown in these Districts.

Cotton.—August 1st, 1953, was the date appointed upon which the Cotton (Tax) (Repeal) Ordinance of 1952 became effective.

Government Notices specified the cesses payable to the Native Treasuries on cotton produced in various districts of the Lake Province, the rate in each case being two cents per pound. Other Notices laid down cotton buying posts and marketing dates, and dates for uprooting and burning cotton plants and cotton residues respectively.

Sisal.—The Sisal Cess Order of 1953 changed the rate of cess upon all sisal produced in the Territory during or after May, 1953, to Shs. 7/50 per ton for sisal and Shs. 1/50 for sisal flume and tow, and all unexportable fibre. In addition, an annual rate of Shs. 375/- was to be levied on all registered sisal plantations planted with sisal in the Territory, subject to certain provisos. These cesses were payable to the Tanganyika Sisal Growers' Association.

Pyrethrum.—The Pyrethrum (Levy Order) of 1953, which revoked the previous Order of 1950, imposed a levy based upon the pyrethrin content of all pyrethrum produced in the Territory at the rates varying with the areas in which pyrethrum is grown.

Castor.—The Produce Export (Castor seed) Rules of 1953 laid down that no castor seed shall be exported except in new bags which are to be securely and doubly sewn with overlapping edges and red thread. They shall also be clearly marked with the words: "Castor seed" in block letters not less than two inches in height, and the bags shall contain not less than 146 lb. of castor seed.

Coffee.—The African Agricultural Products (Bukoba Native Coffee Board) (Disposal of Moneys) Ordinance made provision for the distribution among the producers of money which had accrued to the Bukoba Native Coffee Board from the marketing of coffee.

The Produce Export (Bukoba Coffee Husks) Rules of 1953 laid down that coffee husks intended for export, from the port of Bukoba, were, for the purpose of the Produce Export Ordinance, declared to be produce under the African Produce Cess Ordinance of 1952. Such cesses were to be paid by the exporter to the Native Authority concerned, the rate varying according to the price paid to the producer.

Various Agricultural Products.—The Export Seeds (Collection of Levy) Rules of 1953 which came into force as from 20th October, 1953, laid down that the levy imposed on the industry should be collected by the Tanganyika Seeds Board.

Sanction was given to the Native Authorities of the Southern Province to make orders, for the purpose of controlling the production and marketing of beeswax, honey and the waxes of other insects.

The Crops (Increased Production) Ordinance.—The Ordinance which provides for the establishment of District Production Committees whose work is concerned with guaranteed minimum returns and is described in an earlier section of the report, having lapsed, was renewed under the title: "An Ordinance to Review and Amend the Crops (Increased Production) Ordinance."

Fisheries.—By Government Notices under the African Produce (Cess) Ordinance it was laid down that in the Districts of Ufipa, Kigoma and Mpanda, a cess of two cents per pound should be imposed in respect of dried Whitebait (dagaa) such cess being paid by the exporter to the Native Treasury of the Federation concerned.

Various orders under the Native Foodstuffs Ordinance were made whereby no person shall remove the various stated food crops from the District concerned without the permission of the District Commissioner of that District.

Plant Protection.—Government Notices under the Plant Protection Ordinance ordered the uprooting and burning of tobacco plants, residues and refuse in or near tobacco premises in named areas.

EXPERIMENTS AND INVESTIGATIONS

Experiment stations, which are regarded as "first order" stations are the Ukiriguru Agricultural Station in the Lake Province, the Ilonga Agricultural Station in the Eastern Province, the Coffee Research Station at Lyamungu, Moshi, and the Sisal Research Station at Mlingano, Tanga. The Empire Cotton Growing Corporation continued to maintain a team of scientific officers at the two former stations. The Coffee Research Station which is the property of the Coffee Board was maintained as to the recurrent costs by the Board, all Departmental staff being carried by Government, and at the Sisal Research Station which is wholly financed by the Tanganyika Sisal Growers' Association, the Senior Research Officer and others of the staff were, as formerly, seconded members of the Department.

A team of the Colonial Insecticide Research Unit began a three years' investigation at the Ilonga Agricultural Station. A number of "second order" stations are maintained. A good deal of field experimentation was carried out by district agricultural staff. An Agricultural Officer Experiments) conducted a programme of experimental work in the Southern Highlands. The reports of all these activities will be fully described in Part II of this report which will include also accounts of the more scientific work of specialist officers. A list of these reports is given below:—

(Cotton and Other Crops)

Progress Report of the Ukiriguru Agricultural Station for the season 1952-53.

Summary of the Annual Report of the Ilonga Agricultural Station, Eastern Province, for the year 1953.

The Colonial Insecticide Research Unit, Ilonga, 1953.

(Coffee)

Coffee Research Station, Lyamungu, Moshi, Annual Report for the year 1953.

An Account of the work at Maruku Coffee Station, Bukoba, for the year 1953.

An Account of the work at Mbosi Coffee Station, Southern Highlands Province, for the year 1953.

(Sisal)

Sisal Research Station, Mlingano, Ngomeni, Annual Report for the year 1953.

(Entomology)

Annual Report of the Entomologist, Morogoro, for the year 1953.

Annual Report of the Entomologist, Lyamungu, for the year 1953.

Annual Report of the Entomologist, Arusha, for the season 1952-53.

(Plant Pathology)

Annual Report of the Plant Pathologist for the year 1953.

(Botany)

Annual Report of the Botanist for the season 1952-53.

(Fisheries)

Annual Report of the Fisheries Officer (Inland Fisheries) for the year 1953.

Annual Report of the Fisheries Officer (Fish Farming) for the year 1953.

(Beeswax)

Annual Report of the Beeswax Officer for the year 1953.

(Soil Conservation)

Soil Conservation Service Annual Report for the year 1953.

(Field Experiments)

Summary of the Annual Report of the Agricultural Officer (Experiments), Southern Highlands Province, for the year 1953.

(Coast Agricultural Station)

Summary of the Annual Report of the Agricultural Officer (Coast Agricultural Station), Chambesi, for the year 1953.

(Government Food Farm)

Summary of the Annual Report of the Officer-in-charge, Lupiro Food Farm, for the year 1953.

Igumbiro Tobacco Farm, Iringa, 1953.

Morogoro Farm Report, 1953.

Tribal Farms, Central Province, 1953.

Summary of the Annual Report, Mahiwa Agricultural Station, Southern Province, for the year 1953.

Kungului Farm, Tanga Province, 1953.

East African Agricultural and Forestry Research Organization Fertilizer Trials, 1953.

Experiments in the Northern Province and Land Reclamation Trials on Saline Soils, 1953.

Notes on Trials in the Tanga Province, 1953.

STAFF—EUROPEAN

The Director was appointed Acting Member for Agriculture and Natural Resources for three months during the second half of the year. During this period, the Deputy Director acted as Director.

In December, the Department lost one of its most valued members by the untimely death after a long illness of Mr. N. V. Rounce, Regional Assistant Director.

One Agricultural Officer left on retirement at the end of the year; one was promoted Director of Agriculture, Seychelles, in August, and two resigned. Two Agricultural Officers left in August to take their Trinidad course after serving a preliminary year in the Territory. Two new Agricultural Officers assumed duty in January, and a third in August. One Agricultural Officer returned in March from the Second Devonshire Course. Another left to take this course in August and a third attended a training course on agricultural statistics at Ibadan, Nigeria, in the middle of the year. At the end of the year, including the two officers in Trinidad, there were only thirty-four serving Agricultural Officers against an establishment of forty-nine. This position will be slightly alleviated by the arrival of four new officers in the latter part of 1954, and at the time of writing only two more have been selected to arrive in 1955.

On the specialist side, a new Plant Pathologist assumed duty in August, and a candidate was selected for secondment to the Southern Highlands Non-Native Tobacco Board to take charge of the tobacco experimental Station. The Entomologist's assistant resigned on her marriage but continued to work on temporary terms. The initial establishment of Field Officers (Agriculture) was one hundred and two, but it was increased later in the year by two contract posts reimbursed by the Bukoba Native Coffee Board. Of

this establishment, forty-eight posts were financed by the Agricultural Development Reserve, Provincial Cotton Committees and other external bodies. At the beginning of the year, eighty-two posts were filled. There were seven casualties and thirteen new appointments, leaving a total of eighty-eight serving officers at the end of the year.

The post of mechanic at Lyamungu was upgraded but no satisfactory candidate has, as yet, been obtained.

Staff—Non-European

The Clerical staff consisted of:—

1 Office Assistant
20 Executive Division clerks
53 General Division clerks
39 Subordinate Service clerks

The Field Staff included:—

6 African Agricultural Assistants
1 Indian Master, Junior Service
2 Chemical Assistants (one seconded from the Government Chemist)
1 Hostel Warden
9 Coffee Grading Assistants
97 Recorders
28 Artisans
172 Instructors, Junior Service
632 Instructors, Subordinate Service
504 Instructors, Food Production Staff
41 Instructors, Bee-Keeping
32 Instructors, Copra Industry
12 Laboratory Assistants
57 Overseers
13 Instructors (Fisheries)
82 Motor and Tractor Drivers
6 Teachers
128 Instructors on probation
2 Industrial Instructors
1 Telephone Operator
1 Engineer

The title "African Agricultural Assistant" was changed to "Assistant Agricultural Officer" and refers to the six officers who have taken the Makerere course. One of these left in August to take the second Devonshire Course in the United Kingdom, and a second attended the training course on agricultural statistics at Ibadan, Nigeria.

PUBLICATIONS

Articles sent to the Editor, *East African Agricultural Journal* for publication during the year 1953 were as follows:—

January issue:

"Fallow Farming in Queensland" by A. H. Saville.

April Issue:

"The Sorghums and Sorghum Improvement in Tanganyika" by H. Doggett.

October Issue:

"Brown Spot of Maize" by G. B. Wallace.

The following publications were produced during the year:—

Departmental Pamphlets

No. 52 "The Pawpaw, its Botany, Cultivation, Diseases and Chemistry" by P. J. Greenway, G. B. Wallace, M. M. Wallace and E. V. R. Khomo.

No. 53 "Disease of Sorghum" by G. B. Wallace

also

No. 55 Swahili version.

No. 56 Seventeenth Annual Report of the Coffee Research Station, Lyamungu.

No. 57 "Maradhi ya Panama ya Migomba" by G. B. Wallace.

No. 58 The Eighteenth Annual Report of the Coffee Research Station, Lyamungu.

Leaflets

No. 23 "Instructions for the Collecting, Packing and Despatch of Insects and Diseased Plant Material to the Laboratories" by G. B. Wallace.

Mycological Circulars

No. 32 "Die Back in Coffee—relation of pruning methods to forms of the disease" by G. B. Wallace.

No. 33 Recent Records No. XVI.

No. 34 Recent Records No. XVII.

Other Publications

Commonwealth—No. 51 Mycological Paper.—"A Supplement to a List of Plant Diseases of Economic Importance in Tanganyika Territory" by G. B. and M. M. Wallace.

"Beekeeping in the Tropics" by F. E. Smith. Bee World 34 (12): 233–245, 1953.

Annual Reports

The Technical and Specialist Officers' Report for the year 1951.

The Agricultural Department Annual Report, Parts I and II for the year 1952.

CONCLUSION

Once again, I take pleasure in acknowledging the devoted service of the Departmental staff. It has been a year of difficulty but, nevertheless, of substantial achievement. I should also like to record appreciation of the voluntary work of those farmers and other members of the public who sit on agricultural committees. Their advice is invaluable.

C. E. J. Biggs,
Director of Agriculture

MONTHLY RAINFALL IN INCHES FOR SEASON 1952/53 AND YEAR 1953
AT PROVINCIAL STATIONS

	Eastern Province Morogoro		Central Province Dodoma		Western Province Tabora		Lake Province Mwanza		Southern Highlands Province Mbeya		Northern Province Arusha		Tanga Province Lushoto		Southern Province Lindi	
	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.	Ins.	Average Ins.
October, 1952 ...	1·83	0·91	0·00	0·20	0·98	0·59	1·14	1·92	0·00	0·64	0·52	1·40	1·20	1·37	1·99	0·66
November, 1952 ...	1·02	2·17	0·15	1·25	2·37	4·04	1·61	4·69	2·23	2·27	5·15	4·42	3·23	3·86	0·77	2·22
December, 1952 ...	0·29	2·88	0·05	3·32	2·55	6·74	0·15	5·91	0·31	5·57	2·26	4·08	1·88	4·38	2·99	5·91
January, 1953 ...	1·64	3·84	6·77	5·13	4·51	5·00	2·37	3·73	7·19	7·58	3·06	2·27	1·52	2·98	7·12	5·63
February, 1953 ...	0·13	3·90	0·08	3·73	1·62	4·95	0·66	3·32	3·52	6·58	0·00	3·35	1·39	2·91	1·84	4·74
March, 1953 ...	3·24	7·04	0·75	4·99	6·86	6·73	6·33	6·26	4·56	6·58	2·93	7·12	2·46	5·71	7·38	6·35
April, 1953 ...	8·27	8·14	1·95	1·84	5·66	5·39	4·10	5·69	4·70	4·58	6·84	14·76	6·23	8·97	5·81	7·80
May, 1953 ...	5·23	3·84	0·09	0·19	0·18	1·14	2·84	3·70	0·62	0·68	12·84	8·19	8·72	7·30	1·51	1·48
June, 1953 ...	0·10	1·12	0·00	0·06	0·00	0·11	2·16	0·74	0·00	0·04	0·91	1·31	0·29	2·12	0·00	0·39
July, 1953 ...	0·79	0·54	0·00	0·00	0·00	0·00	0·00	0·56	0·00	0·03	0·76	0·55	3·19	1·37	0·45	0·32
August, 1953 ...	0·78	0·37	0·00	0·00	0·00	0·04	1·20	0·79	0·00	0·06	1·47	0·75	1·56	0·84	0·05	0·24
September, 1953 ...	0·47	0·66	0·00	0·00	0·67	0·28	0·94	1·82	1·10	0·07	0·29	0·81	0·65	0·69	0·12	0·50
Total for season ...	23·79	35·41	9·84	20·71	25·40	35·01	23·50	39·13	24·23	34·68	37·03	49·01	32·32	42·50	30·03	36·24
October, 1953 ...	1·11	0·93	0·00	0·20	0·23	0·60	2·02	1·89	0·10	0·61	2·77	1·37	3·57	1·37	0·35	0·69
November, 1953 ...	0·41	2·14	0·00	0·75	1·45	4·00	3·96	4·58	1·43	2·27	2·86	4·45	6·25	3·85	0·48	2·12
December, 1953 ...	2·93	2·81	7·02	3·12	8·11	6·64	5·99	5·69	4·13	5·32	3·50	4·02	2·52	4·32	7·80	5·72
Total for the year 1953	25·10	35·33	16·66	20·01	29·29	34·88	32·57	38·77	27·35	34·40	38·23	48·95	38·35	42·43	32·91	35·98

All figures quoted in the above table are abstracted from Summaries of Rainfall records for the year 1952 and 1953 issued by the East African Meteorological Department.

EXPORTS FROM TANGANYIKA OF AGRICULTURAL PRODUCTS, 1948 TO 1953

The following table shows the principal exports of the Territory since 1948 with the value of those for 1953

	Maximum Output for export prior to 1953		1948	1949	1950	1951	1952	1953	Total value for 1952
			Amount	Amount	Amount	Amount	Amount	Amount	
	Year	Tons	Tons	Tons	Tons	Tons	Tons	Tons	£
Sisal	1952	156,167	117,092	132,541	118,909	142,106	156,167	171,151	12,773,839
Cotton Lint	1941	13,106	9,893	10,800	7,006	8,315	11,105	14,749	4,827,244
Coffee	1952	18,619	11,268	12,040	14,991	16,565	18,619	15,239	5,818,836
Hides and Skins	1950	5,471	3,310	4,059	5,471	4,023	3,894	5,536	1,652,480
Barley	–	–	–	–	–	–	88	–	–
Beans and Pulses	–	No figures available		–	8,078	10,638	23,184	10,551	571,891
Beans—Soya	–	–	–	–	–	–	–	674	29,381
Beeswax	1948	905	905	525	315	673	599	672	259,950
Cashewnuts	–	–	–	–	6,532	8,165	11,506	11,358	474,600
Castor Seed	–	No figures available		–	3,302	7,570	12,345	11,754	665,527
Cassava	–	–	–	–	142	6,342	15,177	561	9,834
Copra	1928	9,318	48	3,585	886	–	5,505	1,083	60,255
Fats	1944	1,247	1,689	6	20	123	79	69	4,317
Gum	1944	2,567	1,490	878	2,428	1,788	575	1,384	104,531
Ghee	1942	1,385	272	54	27	4	53	6	1,294
Groundnuts	1936	22,786	3,129	838	75	3,499	9,435	1,088	68,634
Honey	1948	–	–	–	1	–	–	–	–
Kapok	–	No figures available		–	653	381	468	838	174,383
Maize	1952	8,353	3,070	105	7	559	8,353	234	3,590
Millet and Sorghum	1928	7,732	1,914	74	1	4,137	2,767	1,958	59,678
Mangrove Bark	1942	7,291	–	1,446	857	828	967	354	6,563
Onions	1948	2,418	2,418	275	296	446	187	187	7,204
Palm Kernels	–	No figures available		–	323	334	374	578	29,284
Papain	1948	130	130	119	19	18	43	83	265,490
Pyrethrum	1945	697	170	141	175	149	156	155	46,628
Rice	1938	17,965	6,450	1,547	30	151	343	3	211
Rubber	1944	1,314	54	18	8	20	2	–	–
Sesame Seed	1938	5,241	928	6	–	22	496	343	19,144
Sugar	1941	5,454	568	5	2	5	10	1	77
Sunflower Seed	1952	17,708	2,298	5,228	8,911	9,512	17,708	6,180	202,389
Tea	1952	1,011	462	427	484	821	1,011	1,122	332,068
Tobacco	1948	1,421	1,421	1,073	1,130	781	641	333	67,284
Vegetable Oil	1940	2,268	1,463	933	1,400	130	685	1,063	103,313
Wattle Bark	–	No figures available		–	1,976	1,318	979	2,009	48,737
Wheat	1945	4,511	–	–	–	–	–	–	–
Essential Oils:									
(a) Lemon Grass	–	–	–	–	(a)	2	2	(g)	117
(b) Orange Oil	–	No figures available		–	8	4	(d)	3	6,162
(c) Geranium Oil	–	–	–	–	(b)	–	(e)	–	–
(d) Others	–	–	–	–	(c)	–	(f)	(h)	253
Total	–	–	170,442	176,723	184,463	229,429	305,523	261,319	28,695,188

(Fractions of tons omitted).

(a) 1,543 lb. (b) 75 lb. (c) 1,539 lb. (d) 2,160 lb. (e) 131 lb. (f) 563 lb. (g) 408 lb. (h) 330 lb.

LIST OF EUROPEAN STAFF ON THE 31ST DECEMBER, 1953

Director: C. E. J. Biggs, B.Sc. (Lond.), Dip. Agric. (Wye), Dar es Salaam.

Deputy Director: J. R. P. Soper, B.A. (Cantab.), Dar es Salaam.

Chief Soil Conservation Officer: L. J. S. Littlejohn, B.Sc. (Glasgow), A.I.C.T.A., Tengeru.

Regional Assistant Directors of Agriculture:

C. J. McGregor, C.D.A., Arusha.
A. H. Savile, C.D.A., A.I.C.T.A., Morogoro.
N. R. Fuggles-Couchman, B.Sc. (Lond.), Dip. Agric. (Cantab.), A.I.C.T.A., Dar es Salaam.
M. Lunan, B.Sc. (St. Andrews), A.I.C.T.A., On leave.

Senior Research Officers:

F. R. Sanders, B.A. (Cantab.), Dip. Agric. (Cantab.), (On secondment—touring South American Coffee Growing States).
G. W. Lock, O.B.E., N.D.A., N.D.D., A.I.C.T.A., Ngomeni.

Entomologists:

G. Swaine, B.Sc. (Sheffield), Morogoro.
R. G. Tapley, B.Sc. (Lond.), Lyamungu.
A. J. Jones, B.Sc. (Zoology) (Wales), D.I.C., Arusha.

Plant Pathologists:

G. B. Wallace, Ph.D., B.Sc. (Edin.), Lyamungu.
N. B. Joy, B.Sc. (Agric.) (Reading), D.T.A. (Trin.), Arusha.

Botanist:

H. Doggett, M.A. (Cantab.), A.I.C.T.A., Ukiriguru

Agricultural Officers:

J. K. Robertson, B.Sc. (Agric.) (Aberd.), A.I.C.T.A., Arusha.
E. T. Ward, C.D.A., Mbeya.
H. L. Brett, Mtwara.
D. G. Jones, B.A. (Cantab.), Dip. Agric. Sc. (Cantab.), A.I.C.T.A., Tabora.
J. B. Clegg, B.A. (Oxon), Lindi.
T. S. Jervis, On leave pending retirement.
R. W. Collett, On leave.
F. E. Luscombe, B.Sc. (Agric.) (Reading), A.I.C.T.A., Moshi.
D. H. Drennan, B.Sc. (Dublin), Dip. Agric. (Cantab.), Lushoto.
A. H. B. Childs, F.L.A.S., M.R.A.C., Tanga.
C. G. Clegg, Dip. Hort. (Wye), Dar es Salaam.
J. D. Hunter-Smith, B.Sc. (Agric.) (Reading), A.I.C.T.A., Tengeru.
J. S. Gunn, B.Sc. (Agric.) (Edin.), Dip. Agric. (Cantab.), Chambezi.
W. G. Brookbank, B.Sc. (Agric.) (Reading), On leave.
K. Johansen, B.Sc. (Agric.) (Edin.), Dodoma.
N. E. S. Mutter, B.Sc. (Agric.) (Leeds), Mwanza.
C. C. Shapland, B.Sc. (Agric.) (Reading), Dip. Agric. (Cantab.), D.T.A. (Trin.), Mwanhala.
G. K. Reakes-Williams, B.Sc. (Agric.) (Wales), Dip. Agric. (Cantab.), Maruku.
A. Hamersley, M.B.E., B.Sc. (Agric.)(Reading), Iringa.
I. Constantinesco, B.Sc. (Agric.) (Reading), N. D. Agr.E., Dip. Agric. Eng. (Essex), A.M.I.B.A.E., Malya.
A. E. Carlaw, B.Sc. (Soil Cons.) (Witwatersrand), On leave pending resignation.
A. Sykes, B.Sc. (Agric.) (Reading), On leave.
D. F. Phillips, B.Sc. (Agric.) (Reading), Ilonga.
R. F. Le Duc, B.Sc. (Agric.) (Dunelm), B.Sc. (Pure Science) (Dunelm), On leave.
W. G. Mathewson, B.Sc. (Agric.) (Aberd.), D.T.A. (Trin.), Seconded for Special Duty.
D. V. Chambers, B.Sc. (Agric.) (Dunelm), Songea.
J. Russell, B.Sc. (Agric.) (Belfast), Arusha.
R. Frank, B.Sc. (Agric.) (Leeds), Dip. Agric. (Cantab.), D.T.A. (Trin.), Iringa.
H. Sandford, M.A. (Cantab.), Lyamungu.
D. P. Allan, B.Sc. (Agric.) (Glasgow), Mbosi.
R. F. Loxton, B.Sc. (Soil Cons.) (Witwatersrand), Ifakara.
J. Sinclair, B.Sc. (Lond.), M.Sc. (Dunelm), On leave pending termination of appointment.
M. H. F. Cooper, B.Sc. (Agric.) (Natal), Mbulu.
D. R. Brewin, B.Sc. (Agric.) (Dunelm), D.T.A. (Trin.), Musoma.
B. R. Tarr, B.Sc. (Agric.) (Stellenbosch), D.T.A. (Trin.), Morogoro.
C. L. Norman, B.A. (Cantab.). At Imperial College of Tropical Agriculture, Trinidad.
A. McCallum, B.A. (Cantab.). At Imperial College of Tropical Agriculture, Trinidad.
C. A. Waldron, B.Sc. (Soil Cons.) (Stellenbosch), Iringa.
C. W. Rombulow-Pearse, B.A. (Cantab.), D.T.A. (Trin.), Lyamungu.

Plant Physiologist:

E. C. Diekmahns, B.Sc. (Glasgow), Dip. Agric. Sc. (Cantab.), Ngomeni.

Tobacco Officer:

J. M. Szymanski, Dip. Agric. (Wilno), Tunduru.

Agricultural Officers (Ginnery):

E. Drakley, Mwanza.
D. G. Firth, Morogoro.

Beeswax Officer:

F. G. Smith, B.Sc. (Forestry) (Aberd.), Tabora.

Assistant Beeswax Officer:

S. W. G. Hubbert, Songea.

Fisheries Officers:

G. J. Lockley, Kigoma.
R. E. Gould, Korogwe.
E. H. O. Martin, M.A. (Cantab.), Korogwe.
D. J. Watson, B.Sc. (Aberd.), Dar es Salaam.

Superintendents of Agriculture:

R. B. Silcock, M.B.E., Lushoto.
T. J. Taverner, Tengeru.
E. Pienaar, On leave.

Master Fisherman:

K. Stather, Dar es Salaam.

Field Officers (Agriculture):

D. R. A. Goode, Kondoa-Irangi.
J. I. Thomson, Lyamungu.
D. H. Thwaites, Arusha.
J. F. Tregarthen, Same.
V. C. Allen, Ngudu.
A. M. Pienaar, Singida.
R. C. Faun, Mbeya.
K. H. Groves, On leave pending resignation.
R. C. Flint, Biharamulo.
P. G. Lewis, M.M., Moshi.
W. E. Yeo, On leave.
R. Simpson, Ngomeni.
D. Shepstone, Kahama.
T. W. H. Dore, Tanga.
E. Hall, Kisarawe.
J. M. Van Dyk, Mahenge.
A. Jackson, Mahiwa.
J. Little, Ukiriguru.
R. A. Brown, Ukiriguru.
B. J. Lumby, Njombe.
J. M. Ainley, Handeni.
W. J. V. Jones, Biharamulo.
L. B. Neary, On leave.
L. J. Lloyd, On leave.
M. J. Routh-Herdon, Mwanza.
S. M. Clarke, Matombo.
E. J. Richards, Nzega.
H. E. Dickenson, Mwanza.
H. E. Hubbard, Mahenge.
A. W. Thompson, Maswa.
D. C. Randall, D.C.M., Utete.
A. J. R. Jenkins, Maswa.
F. W. Jollands, Malya.
A. Priestner, Songea.
D. Richards, Ukiriguru.
C. L. P. Heath, On leave.
K. W. E. Bindloss, On leave.
W. I. Reece, Sumbawanga.
G. W. Edwards, On leave.
J. Weir, Iringa.
J. R. Bellamy, Shinyanga.
R. Duncan, Ukiriguru.
T. H. Evans, On leave.
W. D. Buchanan, C.D.A., On leave.
J. Lewton-Brain, On leave.
J. Macer-Wright, Nassa.
T. Drew, On leave.
G. L. Goodhew, A.I.B.A.E., Ilonga.
J. D. Evans, Tengeru.
G. S. Sherriff, Kigoma.
B. E. Sherred, Mtwara.
S. D. Pyman, Tukuyu.
A. E. Favell, Bukoba.
H. W. Stubbings, Maruku.
P. E. Chaplin, Ukiriguru.
R. J. Newbury, Morogoro.
J. W. Packard, On leave.
R. F. A. Clark, Tengeru.
D. D. Bleasdale, On leave pending termination of agreement.
H. G. Tomkins-Russell, Mgeta.
D. Bullen, Jojiro.
W. J. H. Le Bechee, Newala.
P. S. Hogg, Kasulu.
C. Decker, Nyamahona.
D. S. Taylor, Shinyanga.
J. Jones, Iringa.
R. A. Pollard, Mahenge.
J. E. Gardner, Dip. Agric., Newala.
M. J. Simmonds, Nachingwea.
W. I. Kerr, Kilosa.
W. V. Larkin, Bukoba.

J. C. de Chazal, Tunduru.
G. C. White, Geita.
R. G. Foreman, Ngudu.
D. M. G. Bird, Kilwa.
E. C. Green, Lushoto.
J. Dante, Ifakara.
J. A. Spence, Mzumbe.
B. L. Weightman, Ukerewe.
R. J. Mansfield, Tarime.
B. D. Bugden, Tengeru.
R. J. D. Bruce, Mpwapwa.
T. W. G. Howells, Bukoba.
M. Jenner, Jojiro.
D. M. Mowat, Ngomeni.
D. R. Piedot, Shinyanga.
J. T. Barton, Mahenge.
D. W. Phillips, Bagamoyo.
J. S. Weyers, Dodoma.
M. M. Hammond, Lyamungu.
M. F. Barton, Musoma.
M. Shepherd, Tabora.
D. C. Muir, Masasi.
R. I. J. Lopes, Tengeru.
P. K. Howe-Browne, Morogoro.

Entomologist's Assistant:

Mrs. C. A. Wyatt, B.Sc. (St. Andrews), Morogoro.

Education Officers:

J. Hebenton, B.Sc. (St. Andrews), Ukiriguru.
T. K. Parry, B.Sc. (Agric.), Dip. Ed. (Dunelm), Morogoro.

Temporary Scientific Assistant:

Mrs. M. Wallace, M.Sc. (Lond.), Lyamungu.

Secretary:

R. F. Le Duc, B.Sc. (Agric.) (Dunelm), B.Sc. (Pure Science) (Dunelm); (seconded Agricultural Officer), On leave.

Chemist:

L. J. Hart, B.Sc. (Lond.), Dip. Agric. (Cantab.), D.T.A. (Trin.), Lyamungu.

Horticulturist:

L. M. Fernie, Lyamungu.

Office Superintendent:

Mrs. K. M. Craufurd-Benson, Dar es Salaam.

Junior Field Officers:

I. B. W. Friend, On leave pending termination of Agreement.
A. D. P. Angelini, Ukiriguru.

Stenographers:

Miss A. M. Pollard, On leave.
Miss D. O. Bayley, Mwanza.
Miss G. O. Williams, Arusha.
Miss S. E. Routledge, Dar es Salaam.
Miss K. Grant, Dar es Salaam.
Miss D. M. Powell, Morogoro.

Mechanic:

G. H. Bate, Lyamungu.

Entomologist, C.A.I.R.U.:

H. C. M. Parr, B.Sc. (Bristol), Ilonga.

Chemist, C.A.I.R.U.:

G. A. Jones, B.Sc. (Wales), Ilonga.

Zoologist:

H. J. de S. Disney, B.A. (Cantab.), Tengeru.

Executive Officers: District Production Committees:

J. W. Haylock, Moshi.
C. W. Manton, Iringa.
C. H. Taylor, Arusha.